



## IMPACT OF FINANCIAL INFORMATION ON EQUITY STOCK PRICES IN INDIA – A BI-VARIATE STUDY DURING 2005-2013

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### **ABSTRACT**

*The study attempts to examine the extent of influence of release of certain accounting and financial information through the periodical ( quarterly or yearly) publication of financial statements upon the share prices and thus in determining the rates of return on equities in India. The study has taken into consideration the first hundred companies (according to sales turnover in the year, 2011-2012) listed in BSE and NSE. The study period spans over the years from 2004-2005 to 2012-2013 (for knowing the effect of annual result) and 2008-2009 to 2012-2013 (for knowing the effect of quarterly results). Altogether, seventeen financial variables which cover almost all aspects of financial information, viz., liquidity, solvency, profitability and activity have taken into consideration for finding a possible impact of them on share prices as regards their short-term and long-term effects. Bivariate analysis has been carried out and it shows that Net Profit Ratio (NP), Gross Profit Ratio (GP), Total Assets Turnover Ratio (TAT) and Quick Ratio (QR) have significant relationship with rate of return on equity stock. It can be concluded from the results of the study that the rate of return has been influenced by common financial ratios, at least with profitability ratios.*

### **1. Introduction**

Stock market occupies an important position in the national economy of a country. It plays a major socio-economic role by allocating scarce capital resources which requires proper

valuation of securities and provision of an efficient marketplace where investors can buy and sell securities. The proper valuation or accurate pricing of securities is a prerequisite for efficient allocation of scarce capital resources. The formal appraisal of this valuation of securities is done by security analysis. The main objective of security analysis is security valuation (Penman, 2005). Fundamental analysis is one of the major approaches of security analysis and it focuses on fundamental factors relating to the economy, the industry and the company. There is a common belief among the investors and observation among the security analysts, specially among the fundamental analysts that security prices are greatly influenced by the accounting and financial fundamentals which are published in financial statements.

Published financial statements represent the major source of information both to the existing and potential investors. Information obtainable from the published financial statements has two main sources – Profit and Loss Account and Balance Sheet. The shareholders of the company and other interested persons become generally aware of such information after the conclusion of the company's Board Meeting before Annual General Meeting (AGM) and with the publication of annual results in electronic as well as in print media and consequent publication of annual reports. They also become aware of information contained in quarterly results after the conclusion of Board Meeting for declaration of such results and subsequent publication of the same in electronic and print media. The 'semi-strong' form of efficient market hypothesis (EMH) asserts that the security prices adjust rapidly to the release of all publicly available information. Therefore, such information should be quickly reflected in security prices so that the investors cannot consistently earn abnormal returns.

Since the last decade of the last century far reaching developments have taken place in India in the working of stock exchanges. These developments include new challenges, opportunities and threats to all the interested parties in the capital market including the researchers. As a result several researchers have been inclined to address many key areas relating to Indian capital market. In the light of the above inclination of exploring areas of research, impact of the accounting and financial information contained in published financial statements on equity stock prices is a well-cultivated and a thought-provoking area of research. The study on relationship between security prices and accounting and financial variables has thus become an important issue to different market participants for empirically establishing, in the current context of growing Indian capital market too, the underlying behaviour of equity share prices.

## 2. Objectives of the Study

The present study is principally aimed at examining the extent of influence of release of certain accounting and financial information [or earnings reflecting factors (Ou and Penman, 1989a)] through the periodical (quarterly or yearly) publication of the financial statements upon the security prices and thus in determining the rates of return on equities in India.

## 3. Literature Survey

While searching literature on the association between the accounting and financial information contained in published financial statements and security returns, it is found that a number of research works have been undertaken in this area mainly in the developed countries. The seminal paper on this issue is that of Ball and Brown (1968) which examined the security return behaviour of firms in the 12-month period upto and including the month in which annual results were announced. The examined sample was 261 NYSE firms over a 8 year period. It was found that most of the change in the abnormal security returns occurred prior to the month in which annual results was announced. Brown (1970) reported results for a sample of 118 Australian companies during 1959-1968, in the 12 months up to and including the earnings announcement month. He observed that firms that had unexpected increase or decrease in earnings had a 5% increase or 9% decrease in abnormal security returns. Foster (1977) performed a study similar to that of Ball and Brown, but used quarterly results and daily rates of return and concluded that quarterly results conveyed information to the capital market. Beaver, Clarke and Wright (1979) reported significant correlations between the magnitude and sign of unexpected annual earnings change and the magnitude and sign of abnormal returns in the period preceding the annual earnings release. Beaver, Lambert and Morse (1980) examined the information content of security prices with respect to accounting earnings by employing a regression of percentage change in prices on percentage change in earnings per share across firms for each year in the 19 year period from 1958 to 1976 and found that there was a significant positive relation between abnormal rates of return and unexpected annual earnings.

In his classic study, Beaver (1968) examined both trading volume and security return variability at the time of earnings announcement period. A sample of 143 firms was studied during 1961-1965. He examined trading volume in the earnings announcement period relative to that in the period of non-announcement. The study revealed that investors shifted portfolio positions at the time of the earnings announcement and this shift was consistent with the

contention that earnings reports had information content. In his second phase of research, he found that security return variability was 67% higher in the earnings announcement week than in a non earnings announcement week. Foster (1981) reported results for a sample of interim and annual earnings announcements by 53 U.S. firms during 1963-1978 and concluded that differences in the magnitude of security return variability associated with earnings release were due to several accounting and financial variables. Grants (1980) reported similar results for a sample of 747 annual earnings announcements from 211 over-the-counter exchange firms in U.S. market. Morse (1981) examined the behaviour of trading volume activity and security return variability for a sample of 25 NYSE/ASE stocks and 25 OTC stocks during 1973-76. Both the sample showed increased trading volume activity and increased security return variability at the time of earnings releases.

In an event study, one infers whether an event, such as an earnings announcement through published financial statement, conveys new information to market participants as reflected in change in the level of variability in share prices or trading volume over a short time period around the event. Fama, Fisher, Jensen and Roll (1969) conducted the first event study in financial literature. Event studies are joint test of market efficiency and the model of expected rates of return used in estimating abnormal returns. The main objective of these studies is to examine security price performance before, during and after economic events such as stock splits (Fama, Fisher, Jensen and Roll, 1969) and earnings announcements (Ball and Brown, 1968; Beaver 1968). Other examples of event studies include Kigar (1972), Givoly and Lakonishok (1979), Atiase (1985), Bamber (1986), Collins, Kothari and Rayburn (1987), Ou and Penman (1989a), Stice (1991), etc.. Most of these studies found that security return variability and trading volume were significantly greater on earnings announcement days, but the activities changed to normal conditions immediately thereafter.

A contemporaneous association between financial performance and security price changes and a temporal association between present financial performance and future cash flows are important areas of capital market research in Accounting. A few of these studies use information in financial ratios from financial statements to identify mispriced securities and to forecast future earnings more accurately. Ou and Penman (1989a) tried to examine earnings prediction based on a multivariate analysis of financial ratios during the period 1973-1983. They used one summary measure, called probability index (Pr), which combined a large set of

financial statement items. Investment positions (either long or short) were taken on the basis of this measure until market value of security inclined toward intrinsic value. The findings here indicated that the predictive association between earnings predictors and future stock returns capture a good deal of contemporaneous association between earnings and security returns. Using the same summary measure or probability index (Pr), Ou and Penman (1989b) provided an empirical analysis of the association between the accounting numbers in financial statements and the stock price rate of return over 29958 firms over the time period from 1973 to 1983. They concluded that this financial statement information lead stock prices after using cross-sectional correlation and regression analyses. Several research studies appeared after Ou and Penman's earnings prediction research, for example, Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997, 1998).

However, very few studies have assessed the information content of earnings announcement in the capital markets of developing countries. Among these studies, Dickinson and Muragu (1994) and Barnes (1986) shed light on the efficiency of markets respectively in Nairobi and Kuala Lumpur. In the Indian context, we have a seminal work of Rao and Manickaraj (1993) on 73 companies in Bombay Stock Exchange (BSE) during the period of 1979-1988, which observed a positive and sharp reaction to market prices to the release of company fundamentals, however, in an inconsistent manner. Venkateswar (1989) examined the cross-sectional variation in the price reaction to earnings announcements in the Bombay Stock Exchange during 1987-1988 and observed that earnings convey information to the stock market and stock price reaction depends on the magnitude of the unexpected earnings. Obaidullah (1990) examined whether the investment performance of securities is related to their price-earnings ratios. The study considered a sample of 118 companies. The empirical results indicate that security price adjustment to earnings information is biased and inaccurate. Zahir and Khanna (1982) made an attempt to analyse the relationship between share price and some selected accounting and financial factors. The analysis suggested that dividend per share and dividend-price ratios are the most significant variables in explaining the variation in security prices. Mahapatra and Sahu (1993) estimated a model to explain the relative significance of a number of commonly used investment indicators on the variations in the prices of equity shares. The study was conducted on a judgment sample of 19 companies for the period, 1978-1990. Chaturvedi (2000) examined the behaviour of stock prices around the announcement of half-yearly financial results in reaction to the unexpected earnings. This study was based on a sample of 90 stocks

listed at BSE covering more than 6 years and found that stock price responded to the standardized unexpected earnings. Gupta (2001) conducted a study to examine accounting and macro-economic variables on the security prices for the period, 1986-1995 and found no well-defined trend among accounting and macro-economic variables with security prices. Jain (2003) analysed the behaviour of different financial ratios with respect to their relationship to security returns from various angles by using discriminant analysis and multiple regression on a sample size of 332 firms belonging to 3 industrial sectors for the period, 1998-2002. Sen and Roy (2003) tried to examine price-earnings ratio's performance in explaining variation in security prices through a decomposition study. Thirty Indian stocks comprising BSE Sensex have used as the sample for the study involving a data period of 12 years from 1988 to 2000. The study reveals that dividend payout ratio is the single most important factor affecting stock prices.

#### **4. Research Gap**

While reviewing the earlier studies, it has been seen that they have some limitations. Major common problem areas are the limitations relating to study period and sample size covered under them. Both of them are small with an aggregation in period to see the effect, (Venkateswar, 1989). A few of the earlier studies tried to establish the relationship of stock price with only one or two corporate fundamentals (Obaidullah, 1990; Bhandari, 1988, etc.). While finding annual or quarterly corporate reports' ability of conveying information, the researchers generally have wanted to use the rate of return for the shortest period around the day of corporate report announcement, i.e., rate of return covering the price before the announcement to the price after the announcement. In case of some of the earlier studies, the shortest period for which rate of return data were used was a month or a week (Ball and Brown, 1968; Fama, Fisher, Jensen and Roll, 1969; Rao and Manickaraj, 1993, etc.). Though previous researchers tried to analyse the impact of accounting and financial fundamentals on security prices but their findings were mostly uni-dimensional to measure the efficiency level of the respective capital market. (Gupta, 2001; Givoly and Lakonishok, 1979 etc.)

#### **5. Research Methodology**

##### **5.1 Selection of sample companies and study period**

The present study is based on the sample size of 100 companies. The characteristics of the sample are:

- The entire sample has been derived from different Indian industries. No particular industry or sector has been selected for the study.
- Further, two yardsticks have been taken for the selection of sample. They are :
  - a) The companies that have 31st March as their normal closing date of accounts have been taken. This is taken for the sake of uniformity of data period.
  - b) First 100 companies listed in The Stock Exchange, Mumbai (BSE) and National Stock Exchange (NSE), two leading Indian stock exchanges in terms of their sales turnover in the financial year 2011-2012 have been taken into study. Collection of data for this study was started after publication of annual results of that financial year.
- The sample consists of 100 companies for the period of 9 accounting years (2004-2005 to 2012-2013). Data on different financial variables of the sample companies and relevant share prices for calculation of annual earnings have been taken on a yearly basis for analysis of the effect of annual results. Again, the relevant data are collected for the period, 2008-09 to 2012-13 i.e., for 5 years on a quarterly basis for analysis of the effect of quarterly results. However, the year-ending quarter has not been considered for examining the quarterly effect since almost at the same time yearly effect is being obtained and becomes more crucial.
- As already stated, the companies selected are listed in The Stock Exchange, Mumbai (BSE) as well as in National Stock Exchange (NSE).

## 5.2 Data source

The data on each company is collected from 'Prowess' database developed by CMIE, Mumbai. Some data have also been collected from some particular issues of The Economic Times and in some cases from different web-sites of sample companies.

## 5.3 Variables under study

- a) Selection of dependent variable corresponding to the release of accounting and financial information

For the purpose of the analysis, rate of return on share prices has been taken as the dependent or explained variable. Rate of Return at time  $t$  ( $R_t$ ) is as follows:

$$R = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}} \times 100\%$$

$P_t$  (for short-term effect) = Closing Price of a particular equity on the next trading day of the Board meeting date (for publication of annual and quarterly results as the case may be).

$P_t$  (for long-term effect) = Closing Price of a particular equity on the next Board meeting date (for publication of the results of next quarter/ year as the case may be).

$P_{t-1}$  = Closing Price of equity on the Board meeting date.

$D_t$  = Dividend paid at time  $t$ .

$D_t$  has however been excluded for the study mainly for two reasons:

1. The principal objective of the present study is to see only the impact on price change.
2. Usually, the Board meeting date precedes the dividend payment date. Final dividend is paid by a company after A.G.M. (of shareholders).

Therefore, for the study,  $R_t$  is being used after a slight adjustment as follows:

$$R = \frac{(P_t - P_{t-1})}{P_{t-1}} \times 100\%$$

#### b) Selection of different financial ratios

For the study of annual effect, Current Ratio (CR), Quick Ratio (QR), Debt-Equity Ratio (DER), Long-term Debt-Equity Ratio (LDER), Interest Coverage Ratio (IC), Dividend Coverage Ratio (DC), Gross Profit Ratio (GP), Net Profit Ratio (NP), Operating Profit Ratio (OP), Return on Net Worth (RONW), Return on Capital Employed (ROCE), Earnings per Share (EPS), Dividend Payout Ratio (DP), Total Assets Turnover Ratio (TAT), Fixed Assets Turnover Ratio (FAT), Inventory Turnover Ratio (ITR) and Debtors Turnover Ratio (DTR) have been taken as independent variables. The ratios have been chosen following the four important areas of firm's strengths / weaknesses e.g., liquidity, long-term solvency, profitability and activity. For the study of quarterly effect, Gross Profit Ratio (GP), Operating Profit Ratio (OP), Net Profit Ratio (NP) and Earnings per Share (EPS) have been taken as independent variables.

The list of such variables is demonstrated in Appendix I.

#### **5.4 Scheme of investigation**

Bivariate analyses have been carried out in two parts. In first part, the impact of information contained in the annual results on equity stock prices has been examined and in the second part, the impact of information contained in quarterly results on equity stock prices has been examined. Again, the impact of both annual and quarterly results from two angles – one



having long-term impact on equity stock prices and the other having a short-term impact on equity stock prices has been analyzed.

In this backdrop,  $P_{t-1}$  is determined both for short-term and long-term impact. For finding the 'short-term' impact on annual results, time difference is taken by a gap of 1 day, *i.e.*,  $t-(t-1) = 1$  day and for 'long-term' impact the time gap between the same is considered as to be the difference between two consecutive board meetings held for consideration of annual results. For finding impact on quarterly results, 'short-term' time difference is taken as 1 day, *i.e.*,  $t-(t-1) = 1$  day, whereas 'long-term' time difference is taken as number of days between each two consecutive board meetings considering quarterly results.

In bivariate analysis, Pearson's product moment correlation coefficients have been calculated between rates of return and different financial ratios for 100 sample companies to analyse the impact of information contained in annual results and quarterly results on equity stock prices. Then such correlation coefficients have been statistically tested for each year and quarter for the sample period under study. Before that, rates of return for the entire time periods have been calculated as the dependent variable. Again relevant financial ratios as explanatory variables have been extracted or compiled from annual and quarterly results. All the above calculations have been done using MS-Excel and SPSS (Version-18) Packages.

## 6. Findings

Results of bivariate correlation coefficients have been given in Tables 1, 2, 3 and 4. All these results are primarily divided into two parts - annual and quarterly.

Table 1 gives the results of significant correlation coefficients between rates of return and financial ratios from annual results as to be found in long-term effect. The variables which have the most consistent relationship over the years with rates of return are Quick Ratio (QR) and Net Profit Ratio (NP). Variables like Long-term Debt-Equity Ratio (LDER), Dividend Coverage (DC) have the next best relationship. All these variables mentioned above are significant at their expected direction of relationship. Out of eight year study period, the two category variables (QR, NP and LDER, DC) discussed above are significantly related in four and three years respectively. Apart from, some variables like Gross Profit Ratio (GP), Total Assets Turnover Ratio (TAT), Operating Profit Ratio (OP), Debt-Equity Ratio (DER), Debtors Turnover Ratio (DTR), Inventory Turnover Ratio (ITR) and Interest Coverage Ratio (IC) have been found to be significant in one or two years of the study period. In the year ended 2012, no variable has any

significant relationship. The long-term effect for the year ended 2013 has not been found since share prices on the board meeting date declaring the annual results of 2014 year-end were not available when the data was taken for the study. From the above, it can be concluded that the solvency and liquidity ratios have a long-term effect on share price. Net profit margin has also a good long-term effect. No other category of ratios has any consistent long-term relationship with share prices.

Table 2 gives the results of significant correlation coefficients between rates of return and financial ratios from annual results as to be found in short-term effect. Of the results, Total Assets Turnover Ratio (TAT) has been most significant. Besides this, Current Ratio (CR), Dividend Coverage Ratio (DC), Fixed Assets Turnover Ratio (FAT) and Gross Profit Ratio (GP) have the next best relationship. But from the results it can be inferred that the short-term effect of the annual results is confined to a very small number of variables and that too for two or three years during the total nine years of study period. Very exceptionally, the 2005 year-end results show significant relationship in the expected direction in case of as many eight variables. Of the variables found to be significant in that year, turnover or activity category is pre-dominant with the existence of one variable each from liquidity, solvency and profitability margin categories.

Table 3 gives the results of significant correlation coefficients between rates of return and financial ratios from quarterly results as to be found in long-term effect. Out of fifteen quarters under study, no variable has been found to have any effect in seven quarters. All the four variables under study have significant relationship in some quarters. However, Net Profit Ratio (NP) and Operating Profit Ratio (OP) have been most consistent. In case of quarterly results, thus profitability margin ratios have long-term effect on share prices.

Table 4 gives the results of significant correlation coefficients between rates of return and financial ratios from quarterly results as to be found in short-term effect. Out of fifteen quarters under study no variable has been found to have any effect in eight quarters. All the four variables under study have significant relationship in some quarters. However, in this case, Net Profit Ratio (NP), Operating Profit Ratio (OP) and Earnings per Share (EPS) have been found to be most consistent. The short-term effect of the quarterly results is thus predominantly found not only for margin variables but also for investment-based profitability.

If the above findings are summarized in case of short-term effect, the Net Profit Ratio (NP) has been found to be the most significant variable if only the quarterly results are

considered. However, in case of short-term effect, Gross Profit Ratio (GP) has been the most significant variable taking into consideration both annual and quarterly results. In case of long-term effect, no general uniformity is observed about the relationship. However, Quick Ratio (QR), a stricter liquidity ratio and Net Profit Ratio (NP), a profitability margin ratio have the most prominent effect in case of annual results. In case of quarterly results, all the margin ratios have significant effect in some of the quarters under study. However, in absence of information other than the profitability margin category in case of quarterly results, no general conclusion can be drawn for the other variables.

## 7. Conclusion

This study examines the statistically significant explanatory relationship existing between accounting and financial information in the form of certain commonly used financial ratios and rate of return on investment in common equity stock. Bivariate analysis reveals that no single or group of financial ratios have shown significant and meaningful relationship with rate of return for all the years and quarters under study. However, this analysis shows that two profitability ratios viz. Net Profit Ratio (NP) and Gross Profit Ratio (GR), one short-term liquidity ratio viz. Quick Ratio (QR) and one activity ratio i.e. Total Assets Turnover Ratio (TAT) have significant relationship more than once with the explained variable i.e. rate of return on equity stock. The results of the study have fulfilled partially a fundamental analyst's viewpoint of security analysis. It can be inferred from the results of the study that rate of return, considered to be prime motive behind investment in common stock, has been influenced by common financial ratios, at least with profitability ratios.

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## Appendix I

**Financial Ratios as Explanatory Variables**

Financial Ratios	Description
Current Ratio	(Total inventory + Sundry debtors + cash and bank balance + loans and advance)/ (Total current liabilities + cash credit + commercial paper + bridge loans + short term loans to group companies + short term loans to other + inter -corporate deposits + working capital loans)
Quick Ratio	(Sundry debtors + cash and bank balance + loans and advance)/ (Total current liabilities + cash credit + commercial paper + bridge loans + short term loans to group companies + short term loans to other + inter - corporate deposits + working capital loans)

Debt-Equity Ratio	Total debt/ (Share capital + reserves)
Long- Term Debt Equity Ratio	(Total debt–cash credit-commercial paper-bridge loans- short term loans to group companies-short term loans to others- inter-corporate deposits-working capital loans) / (Share capital + reserves)
Interest Coverage Ratio	(Adjusted net profit + tax + interest) / Interest
Dividend Coverage Ratio	Adjusted net profit after tax/Dividend
Gross Profit Ratio	Adjusted gross profit/ Sales
Net Profit Ratio	Adjusted net profit / Sales
Operating Profit Ratio	(Adjusted gross profit + interest – depreciation )/ Sales
Return On Net Worth	(Adjusted net profit – preference dividend)/ (Equity paid up + reserves)
Return On Capital Employed	(Adjusted net profit + tax + interest )/ (Share capital + reserves + total debts- miscellaneous not written off)
Earning Per Share	(Net profit after tax and preference dividend / No. of equity shares)
Dividend Pay-Out Ratio	(Dividend per share/Earnings per share)
Total Assets Turnover Ratio	Sales / (Net fixed assets + investment + working capital)
Fixed Assets Turnover Ratio	Sales /(Gross fixed assets excluding capital work in progress- revaluation reserve)
Inventory Turnover Ratio	Sales/ Total inventory
Debtors Turnover Ratio	Sales / Sundry debtors

## Appendix II

**TABLE - 1**

**Significant Correlation Co-efficients between Rates of Return and Financial Ratios  
(From Annual Results – Long-term effect)**

Year-end / number of companies	200503 N=72	200603 N=68	200703 N=76	200803 N=77	200903 N=88	201003 N=86	201103 N=85	201203 N=86
Significant variables and level of significance	DC (0.028)	DER (0.037)	QR (0.002)	QR (0.004)	QR (0.066)	QR (0.079)	DER (0.07)	
		LDER (0.042)	LDER (0.056)	LDER (0.069)	ITR (0.090)	TAT (0.021)	DTR (0.110)	
		IC (0.006)	DC (0.007)	DC (0.040)			NP (0.094)	
		GP (0.037)	GP (0.049)	NP (0.071)			ROCE (0.096)	
		NP (0.036)	NP (0.006)				TAT (0.133)	
			OP (0.108)					

**TABLE - 2**

**Significant Correlation Co-efficients between Rates of Return and Financial Ratios  
(From Annual Results – Short-term effect)**

Year-end / number of companies	200503 N=55	200603 N=61	200703 N=69	200803 N=78	200903 N=83	201003 N=79	201103 N=85	201203 N=85	201303 N=85
Significant variables and level of significance	CR (0.076)	TAT (0.036)	CR (0.054)	DC (0.101)		TAT (0.081)	GP (0.086)	DER (0.102)	
	IC (0.021)		DC (0.098)			FAT (0.079)		EPS (0.076)	
	GP (0.060)								
	NP (0.064)								
	OP (0.054)								
	ROCE (0.032)								
	TAT (0.087)								
	FAT (0.098)								

:: Figures in parentheses below the each year’s significant variables indicate the actual significance level of the variable.