

An examination of future firm performance and fundamental analysis

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ABSTRACT

The purpose of fundamental analysis is to identify key drivers of firm value. Academic research of fundamental analysis attempts to link fundamental analysis signals (e.g., changes in accounts receivable or research and development) with future returns and earnings. Prior studies using data from the US document significant relationships between fundamental signals and earnings and returns (e.g. Abarbanell and Bushee 1997; Lev and Thiagarajan 1993). While the relationship between fundamental signals and value is well documented in the US, little research examines this relationship in an international setting. The purpose of this study is to examine the ability of the fundamental signals to explain both future earnings and returns of firms in India. India is quickly becoming one of the largest economies in the world. Thus, understanding the relationship between financial statement data and firm performance in India is of increasing importance. The results of this study document a significant relation between fundamental signals and future earnings in India. However, the relationship between fundamental signals and returns and earnings differs substantially that the relationship identified by prior studies in the US.

Keywords: Fundamental analysis, future earnings, annual returns

INTRODUCTION

Fundamental analysis examines the association of key signals derived from financial statements and either earnings and returns. Academic research examining fundamental signals is particularly important as it attempts to show that accounting disclosures other than earnings are useful in predicting firm performance. Research in the US suggests that fundamental signals are associated with future returns, earnings, and analysts' earnings forecasts (see, e.g., Ou and Penman 1989; Lev and Thiagarajan 1993; Abarbanell and Bushee 1997; Abarbanell and Bushee 1998, and Wieland 2011). Results of these studies suggest that non-earnings financial statements information is useful in predicting future earnings. Further, investors and analysts recognize their usefulness as these signals bear an association with future earnings and returns.

Despite the documented relation between fundamental analysis and firm performance in the US, little research has examined this relation in an international setting. This study attempts to partially fill the void by examining the relation between fundamental signals and firm performance in India. India is currently the ninth largest economy in the world as measured by GDP. The economy has experienced sizable growth rates and is one of the leading nations in terms of attracting foreign direct investments.

Despite the impressive performance of the Indian economy, little research investigates the relevance of financial statements in India. Prior to 2011, financial statements were prepared using Indian GAAP. Further, Indian has not adopted International Auditing and Assurance Standards. This calls into question the usefulness of financial disclosures in India. The study provides evidence as to whether Indian financial disclosures are useful in predicting future returns and earnings.

Using a sample of publically traded firms in India, this study examines the association of fundamental signals and firm performance. Five signals are constructed using data from the Global Vantage database. These signals are inventory, accounts receivable, R&D, auditor qualification, and effective tax rate. These signals are regressed on both future returns and earnings. Results of these regressions suggest that the audit qualification and effect tax rate signals are associated with future earnings. This suggests that fundamental signals are useful in predicting future earnings. Results of regression of fundamental signals on future returns suggest that fundamental signals are not predictive of future returns. While this analysis suggests that fundamental signals derived from financial statements are predictive of future firms performance, many differences exist in the relations observed in India and in the US. Future research aimed at understanding these differences could potentially enhance the quality of financial reporting both in India and the US.

The remainder of the paper is organized as follows. Section 2 provides a discussion of the prior literature concerning fundamental signals. Section 3 describes the research design and results from regression analysis. Section 4 summarizes this paper.

LITERATURE REVIEW

Many studies have examined a variety of issues concerning fundamental analysis. Both Richardson et al. (2010) and Lewellen (2010) provide an in-depth analysis of the literature. Examination of fundamental analysis benefited from early work by Ou and Penman (1989), Holthausen and Larcker (1992) and Lev and Thiagarajan (1993). The primary focus of these studies was the identification of fundamental signals. These signals were hypothesize to contain

value-relevant information. Studies like Abarbanell and Bushee (1997), Abarbanell and Bushee (1998), and Wieland (2011) extend the earlier work on fundamental analysis by examining the role of the signals have on both future firm performance and future market returns. Ou and Penman (1989) collected data on 68 potential signals available from the financial statements. These signals were selected on the basis of availability. The authors removed variables that were not significant when regressed on change of future earnings. After screening variables in this fashion, 34 variables remained. The authors then used step-wise regression to reduce the final set of signals to 18. The results showed that these variables are significantly associated with earnings changes. Holthausen and Larcker (1992) based their study on the 68 variables from Ou and Penman (1989) study. Instead of evaluating the value relevance of the signals based on future change in earnings the authors used future excess returns. The results revealed that many of the signals are associated with future returns.

Lev and Thiagarajan (1993) utilized a different approach in selecting signals by examining those used by financial analysts. This method is significantly different than previous attempts that conducted a search for relevant signals. Lev and Thiagarajan (1993) analysis of the information used by financial analysts yielded twelve signals. These twelve signals capture information related to inventories, accounts receivable, capital expenditures, research and development (R&D), gross margin, selling and administration expenses, provision for doubtful receivables, effective tax rate, order backlog, labor force, LIFO earnings and audit qualification. The authors examined the association of the twelve signals and annual returns. In the full sample analysis the coefficients for inventory, accounts receivable, capital expenditure, gross margin, selling and administration expenses, and order backlog signals are significant. These results suggest that these signals contain value relevant information. In further analysis, the authors excluded the R&D, provision for doubtful accounts and order backlog signals. Since many firms do not report these variables, dropping the variables increased the sample size. This second set of analysis reveal that the inventory, accounts receivable, capital expenditure, gross margin, selling and administration expenses, effective tax rate and labor force signals are value relevant. The Lev and Thiagarajan (1993) signals have served as the basis of many studies on fundamental analysis.

Abarbanell and Bushee (1997) incorporated the Lev and Thiagarajan (1993) fundamental signals into their analysis of the association of the signals and future earnings. The authors used only nine of the twelve signals from Lev and Thiagarajan (1993). The three excluded variables were R&D, order backlog and provision for doubtful accounts. Data for these variables is limited and inclusion result in a small sample. The results of analysis of future change in EPS and fundamental signals reveal a significant association of many of the signals. The variables inventory, gross margin, effective tax rates, LIFO and labor force have statistically significant coefficients. The coefficients for these variables have the expected sign. For example the coefficient for the inventory variable is negative. This result suggests that an increase in finished goods inventory with respect to sales in negatively associate with future earnings. In additional analyses, the authors examined the association of the signals and analysts' forecast revisions. The results indicate gross margin, effective tax rate and labor force variables are significantly associated with analysts' behavior. Overall the authors present convincing evidence of the value relevance of fundamental signals.

Abarbanell and Bushee (1998) examined the association of fundamental analysis and abnormal returns. The results indicate that the inventory, gross margin and selling and administration expenses variables are statistically associated with future abnormal returns. Using

the established signals from Lev and Thiagarajan (1993), Luchs et al. (2011) examined the association of fundamental analysis and contemporaneous returns in India. These signals include: inventory, accounts receivable, R&D, auditor qualification, and effective tax rate. The inventory, accounts receivable R&D, and effective tax rate signals are statistically significant when regressed on returns. Of these five signals only the inventory and accounts receivable signals are statistically significant in the Lev and Thiagarajan (1993). The differences in the results of the two studies reveal potential differences in the two capital markets. Piotroski (2000) examined high book-to-market firms using fundamental analysis. The author employed a trading strategy based on the information contained in the fundamental signals. This method yielded above average returns. Aggarwal and Gupta (2009) examined high book-to-market stocks in India. The authors used a variation of the fundamental signals to construct an F_Score for each firm. Results for firms with a high F_Scores, denoting positive signals, show that these firms greater than market returns.

This study adds to the literature on fundamental analysis by examining the signals association with future earning and returns in India. The results of Luchs et al. (2011) analysis of Indian firms on the association of fundamental signals and contemporaneous returns contradict the results of Lev and Thiagarajan (1993) analysis of US firms. Both Piotroski (2000) analysis of high book-to-market US firms and Aggarwal and Gupta (2009) analysis of high book-to-market Indian firms yielded similar results. Emerging research examines the potential universal nature of fundamental analysis by applying the analysis to other capital markets. Results of these studies not only add to the understanding of fundamental analysis but seek to identify significant differences in international capital markets.

METHODOLOGY AND RESULTS

Using the methodology developed by Lev and Thiagarajan (1993) the following models are used to examine the relationship between firm performance and fundamental signals. The first model includes only change in EPS as an independent variable and serves as a benchmark to examine the incremental explanatory power of fundamental signals. The second model adds the fundamental signals:

$$F_Perf = \alpha + \beta \Delta EPS_{it} + \epsilon_{it}; \quad (1)$$

Where:

F_Perf	=	Proxies for future performance that includes F_EPS _{it+1} and F_Ret _{it+1}
F_EPS _{it+1}	=	Year ahead earnings per share.
F_Ret _{it+1}	=	12 month return beginning the month of the financial statement release.
Δ EPS _{it}	=	The annual change in EPS (primary, excluding extraordinary items), deflated by beginning-of-year share price.
e _{it}	=	Error term from regression analysis.
i	=	1, 2, 3, ..., n, number of firms.

The next model incorporates the five fundamental signals:

$$F_Perf = \alpha + \beta_0 \Delta EPS_PT_{it} + \beta_1 INV_{it} + \beta_2 AR_{it} + \beta_3 RD_{it} + \beta_4 AO_{it} + \beta_5 EffTax_{it} + e_{it} \quad (2)$$

Where:

F-Perf	=	Proxies for future performance that includes F_EPS_{it+1} and F_Ret_{it+1}
F_EPS_{it+1}	=	Year ahead earnings per share.
F_Ret_{it+1}	=	12 month return beginning the month of the financial statement release.
ΔEPS_PT_{it}	=	The annual change in Pretax EPS (primary, excluding extraordinary items), deflated by beginning-of-year share price.
INV_{it}	=	Inventory measured as $(\Delta Inventory) - (\Delta Sales)$ The Inventory variable used is 'Finished Goods' when available, and 'Total Inventory' otherwise.
AR_{it}	=	Accounts Receivable measured as $(\Delta AR) - (\Delta Sales)$
$R\&D_{it}$	=	Change in firm-specific R&D
AO_{it}	=	Auditor Qualification, 1 for Qualified, 0 for Unqualified
$EffTax_{it}$	=	$PTE_{it}(T_{it-1} - T_{it})$, PTE_t = pretax earnings at time t, deflated by beginning price
T_{it}	=	Effective tax rate
e_{it}	=	Error term from regression analysis
i	=	1, 2, 3, ..., n, number of firms

Two proxies are used to measure firm performance: future earning and future returns. Significant coefficients on the change in EPS variable suggest that current year change in EPS is associated with future firm performance. Similarly significant coefficients on the fundamental signals variables suggest that fundamental signals are associated with future firm performance.

The data used in the analysis are drawn for the Compustat Global Vantage database. Only five of the original twelve signals from Lev and Thiagarajan (1993) could be constructed due to data limitation and accounting rules. The signals used in the analysis are inventory, accounts receivable, R&D, auditor qualification, and effective tax rate. The sample consists of 291 firms and 398 firm-years. To control for the effect of time period specific conditions fixed year effects are included in the model. Also to control for extreme observations the data was winsorized at 5%. Data below the 5th percentile and above the 95th percentile are recorded as the 5th and 95th percentiles, respectively.

Table 1 contains descriptive statistics for the sample of 398 Indian firms-years. Future EPS, a measure of the EPS of the next fiscal year has a mean (median) of 0.351 (0.243), indicating firms maintained positive earnings during the sample period. Both pre-tax and after tax-change in EPS are positive, suggesting the firms experienced increases in earnings during the research period. The average of the inventory signal variable is -0.022. Inventory decreases generally suggest higher than expected sales and suggest higher current and future earnings (Lev and Thiagarajan 1993). The mean (median) accounts receivable signal was positive for the period is 0.023 (0.175), suggesting that, on average, accounts receivable increased during the research period. Increases in accounts receivable increases may suggest difficulties in selling the firm's products as well as an increasing likelihood of future earnings decreases from increases in receivables' provisions (Lev and Thiagarajan 1993). The research and development signal increases during the research period, indicating increases in spending on research and

development. Such increases are thought to be associated with increases in future earnings and returns. Finally, the average effective tax rate increased over the research period. Assuming that this increase is not a result of increases in the statutory tax rate, it is typically viewed as a positive signal (Lev and Thiagarajan 1993).

Table 2 reports correlation analysis for the sample firms. As expected, future returns and earnings are positively associated with current year change in EPS (both per and post tax measures). Future returns are positively (negatively) correlated with inventory, R&D, auditor opinion, and effective tax rate (accounts receivable) signals. Future earnings are positively (negatively) correlated with R&D, auditor opinion, and effective tax rate (accounts receivable and inventory) signals. None of the correlations between independent variables are high enough to suggest a problem with multicollinearity. Further, variance inflation factors are computed to test for multicollinearity. The results of this analysis provide no evidence of multicollinearity problems.

The second column of Table 3 provides results of the regression of year-ahead EPS on current year change in EPS, fundamental signals and year indicator variables (coefficients not reported). The first column reports the benchmark regression of future earnings on current year change in EPS and year indicator variables. The Adj-R² from this regression is 11.77%, suggesting that the current year change in EPS and the year indicator variables explain a sizable portion of variation in future earnings. The coefficient on the changes in EPS variable is 1.077 (t-stat = 6.58, p<0.01). This suggests that current year change in EPS is significantly related to future earnings. Thus, firms experiencing current earnings growth are likely to realize additional earnings growth in future years.

The last column of Table 3 reports the results of the regression of future earnings on change in current year earnings, fundamental signals and year indicator variables (coefficients not reported). The Adj-R² of this model (10.48%) is slightly lower than the benchmark model. This is primarily the result of a decrease in the significance of the year indicator variables (not reported in table). Consistent with the benchmark model, the coefficient on the pre-tax change in EPS variable is positive and significant (t-stat = 3.61, p<0.01). This result indicates that current year change in earnings bears a positive relationship with future earnings changes. With respect to the fundamental signals, the audit opinion variable is negative and significant (t-stat = -3.07, p<0.01) and the effective tax rate variable is positive and significant (t-stat = 4.59, p<0.01). This indicates that, all else being equal, adverse audit opinions are associated with lower future earnings and increases in the effective tax rate are associated with increases in future earnings. Of the five variables in both the Abarbanell and Bushee (1997) and the current study only the effective tax rate variable is significant in both studies. In the Abarbanell and Bushee (1997) study of US firms the inventory, gross margin, LIFO and labor force variables were also statistically significant. The inventory variable is not significant in this study. The result suggests that unlike in the US capital markets a change in inventory is not significantly associated with future earnings. In both studies the coefficients for the accounts receivable and R&D variables are insignificant, indicating that in both capital markets these variables have no discernable bearing on future earnings.

Table 4 provides results of regression of year-ahead returns on current year change in EPS, fundamental signals and year indicator variables (coefficients not reported). The second column of the table reports the benchmark regression of change in EPS on returns. The Adj-R² from this regression is 20.20%, indicating that change in EPS and the year indicator variables explain a substantial amount of variation in future returns. Further, the coefficient on the CEPS

variable is positive and significant (t-stat = 6.58, $p < 0.01$). This indicates that current year change in EPS is positively associated with future returns.

Column 3 of Table 4 reports the regression of future returns on current year change in EPS, fundamental signals and year indicator variables. The explanatory power of the model remains strong with an Adj- R^2 of 19.37%. Similar to the results reported in the previous column, the coefficient on the change in pre-tax EPS variable is positive and significant (t-stat = 3.61, $p < 0.01$), indicating that current year change in pre-tax EPS is associated with future returns. Interestingly, none of the fundamental signals are significantly associated with future returns. These results are different than those in reported in Table 3, suggesting that fundamental signals possess the ability to explain future earnings but not future returns. One explanation for this phenomenon is that investors recognize the relation between current year fundamental signals and future earnings and these signals are incorporated into current stock prices. The results from Abarbanell and Bushee (1998) analysis of fundamental signals and future returns in the US reveal significant coefficients for inventory, gross margin and selling and administration expenses. Comparing the two studies highlights differences in the two capital markets.

SUMMARY

Fundamental analysis is the study of how financial statement is related with future earnings and returns. Extensive prior research in the US documents a relation between fundamental signals and future earning and returns (see e.g., Lev and Thiagarajan 1993; Abarbanell and Bushee 1997). Despite the importance of this line of research, little analysis of this topic has been conducted outside the US. To extend the knowledge of fundamental analysis, the purpose of this study is to examine the ability of the fundamental signals to explain future earnings in India. India is quickly becoming a dominant economy. A better understand of the relevance of financial data in this market will help investor make informed decisions on the relevance of Indian financial reports. Further, this analysis may be of interest to regulators who are attempting to increase the efficiency of capital allocation in India.

Using data from Indian firms, measures of performance (i.e., future earnings and returns) are regressed on five fundamental signals original identified by Lev and Thiagarajan (1993). The results show that the audit opinion and effective tax rate signals are statistically associated with future earnings. The coefficient for the audit opinion is negative, suggesting adverse audit opinions are associated with lower future earnings. The coefficient of the effective tax rate variable is positive indicating increases in the effective tax rate are correlated with increases in future earnings. Additional analysis of the fundamental signals and future returns reveal that none of the coefficients of the five signals are statistically significant. This result suggests that the market incorporates the information of the returns in the current period. The results of this analysis are then compared to those based on US firms documented by Abarbanell and Bushee (1997). In contrast to this analysis, Abarbanell and Bushee (1997) found the inventory, gross margin, effective tax rates, LIFO and labor force variables statistically associated with future earnings in the US capital markets.

In sum, this analysis suggests that Indian financial disclosures are useful in predicting future earnings and returns. Thus, evidence is provided to support the relevance of Indian financial disclosures. However, comparison with similar analysis conducted in the US by Abarbanell and Bushee (1997) reveal substantial differences in between the two countries.

Further research is needed to examine the causes of these differences and their potential implications to financial statement users.

VII. REFERENCES

- Abarbanell, J.S., & Bushee, B.J. (1997). Fundamental Analysis, Future Earnings, and Stock Prices, *Journal of Accounting Research*, 35(1), 1-24.
- Abarbanell, J.S., & Bushee, B.J. (1998). Abnormal Returns to a Fundamental Analysis Strategy, *The Accounting Review*, 73(1), 19-45.
- Aggarwal, N, & Gupta, M. (2009). Do High Book-to-Market Stocks Offer Returns to Fundamental Analysis in India?, *Decision* 36(2), 155-175.
- Holthausen, R.W., & Larcker, D.F. (1992). The Prediction of Stock Returns Using Financial Statement Information, *Journal of Accounting and Economics*, 15, 373-411.
- Lev, B., & Thiagarajan, S.R. (1993). Fundamental Information Analysis, *Journal of Accounting Research*, 31(2), 190-215.
- Lewellen, J. (2010). Accounting anomalies and fundamental analysis: An alternative view. *Journal Of Accounting & Economics*, 50(2/3), 455-466.
- Luchs, C., Maheshwari, S., & Myring, M. (2011). An Empirical Test of Fundamental Analysis in India, *DIAS Technology Review-The International Journal for Business and IT* 16 (October-March).
- Ou, J.A., & Penman, S. H. (1989). Financial Statement Analysis and the Prediction of Stock Returns, *Journal of Accounting and Economics*, 11. 295-329.
- Piotroski, J. D. (2000). Value Investing: The Use of Historical Financial Statement Information to Separate Winners from Losers. *Journal of Accounting Research*, 38(3), 1-41.
- Richardson, S., Tuna, İ., & Wysocki, P. (2010). Accounting anomalies and fundamental analysis: A review of recent research advances. *Journal of Accounting & Economics*, 50(2/3), 410-454.
- Wieland, M. M. (2011). Identifying Consensus Analysts' Earnings Forecasts that Correctly and Incorrectly Predict an Earnings Increase. *Journal of Business Finance & Accounting*, 38(5/6), 574-600

Table 1
Sample Statistics

Where:

Variable	Mean	Median	Std. Dev.
F_EPS_{it+1}	0.351	0.243	0.519
F_Ret_{it+1}	-0.020	-0.174	0.560
ΔEPS_{it}	0.004	0.001	0.170
ΔEPS_PT_{it}	0.016	0.009	0.163
INV_{it}	-0.022	-0.023	0.218
AR_{it}	0.023	0.175	0.225
RD_{it}	0.114	0.015	0.558
AO_{it}	0.183	0	0.388
$EffTax_{it}$	0.039	0	0.179

F_EPS_{it+1}	= Year ahead earnings per share.
F_Ret_{it+1}	= 12 month return beginning the month of the financial statement release.
ΔEPS_{it}	= The annual change in EPS (primary, excluding extraordinary items), deflated by beginning-of-year share price.
ΔEPS_PT_{it}	= The annual change in Pretax EPS (primary, excluding extraordinary items), deflated by beginning-of-year share price.
INV_{it}	= Inventory measured as $(\Delta Inventory) - (\Delta Sales)$.
AR_{it}	= Accounts Receivable measured as $(\Delta AR) - (\Delta Sales)$.
$R\&D_{it}$	= Change in firm-specific R&D.
AO_{it}	= Auditor Qualification, 1 for Qualified, 0 for Unqualified;
$EffTax_{it}$	= $PTE_{it}(T_{it-1} - T_{it})$, PTE_t = pretax earnings at time t, deflated by beginning price.

TABLE 2
Correlations

	F_Ret _{it+1}	CEPS _{it}	CEPS_PT _{it}	INV _{it}	AR _{it}	RD _{it}	AO _{it}	EffTax _{it}
F_EPS _{it+1}	0.048	0.335	0.211	-0.022	-0.054	0.031	-0.129	0.214
F_Ret _{it+1}	•	0.059	0.066	0.008	-0.109	0.067	0.007	0.145
ΔEPS _{it}		•	0.826	-0.189	-0.109	0.067	0.007	0.145
ΔEPS_PT _{it}			•	-0.217	-0.113	0.068	0.012	0.187
INV _{it}				•	0.113	-0.065	-0.051	0.006
AR _{it}					•	-0.014	0.012	0.106
RD _{it}						•	0.060	0.038
AO _{it}							•	0.005

Variables defined in table 1.



Table 3
Regression of Year-ahead Earnings on
Current EPS and Fundamental Signals

Variable	Coefficients (t-stat)	Coefficients (t-stat)
Intercept	0.052 *** (5.24)	0.599 *** (5.67)
ΔEPS_{it}	1.077 *** (6.58)	
$\Delta\text{EPS_PT}_{it}$		0.604 *** (3.61)
INV_{it}		0.021 (0.18)
AR_{it}		-0.166 (-1.45)
RD_{it}		0.010 (0.22)
AO_{it}		-0.216 *** (-3.07)
EffTax_{it}		0.659 *** (4.59)
Adj R ²	11.77%	10.48%

Variables defined in Table 1. *** significant at the 1% level, ** significant at the 5% level, *significant at the 10% level. Year indicator variables included in regression but coefficients not reported.

Table 4
Regression of Year-ahead Returns on
Current EPS and Fundamental Signals

Variable	Coefficients (t-stat)	Coefficients (t-stat)
Intercept	-0.066 (-0.64)	-0.076 (-0.70)
ΔEPS_{it}	0.556 *** (3.43)	
$\Delta\text{EPS_PT}_{it}$		0.620 *** (3.61)
INV_{it}		-0.179 (0.15)
AR_{it}		-0.020 (-0.17)
RD_{it}		0.031 (0.66)
AO_{it}		-0.002 (-0.03)
EffTax_{it}		-0.001 (-0.11)
Adj R ²	20.20%	19.37%

Variables defined in Table 1. *** significant at the 1% level, ** significant at the 5% level, *significant at the 10% level. Year indicator variables included in regression but coefficients not reported.