Differences in Stock Price Sensitivity to Accounting Information : Implications for Creative Accounting

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Abstract

Purpose/Objective: This paper is an attempt to re-visit the concept of value relevance of accounting information to draw implications for creative accounting. It explores the hypothesis that value relevance, of various accounting variables, varies depending upon the business sector to which the firm belongs.

Design/Methodology/Approach: This paper verified the above objective in the Indian context for firms in the BSE SENSEX using annual data for the period from 2000-2013 and generalised least squares regressions in the log-log form, with stock prices as dependent variables and the contemporaneous BSE SENSEX as the control variable. Book value of equity, revenue, profits after tax, and dividend were the chosen accounting items whose value relevance was examined (independent variables). Sector wise, cross sectional regression analysis was performed. To examine the significance of each of the independent variables on the stock price, univariate regressions were undertaken.

Findings: The regression results indicated that the value relevance of the chosen accounting variables varied depending on the business sector. While profits after tax significantly influenced the stocks of all chosen sectors except for automobile ; additionally, revenues in the case of IT and FMCG and book value of equity in the banking sector influenced the prices of their stock prices. In the case of automobiles, 'revenues' is the only significant explanatory variable of stock price.

Originality/Value : This paper adds a new dimension to the literature of creative accounting. It suggests that the choice of the creative accounting variable might depend on the business sector to which the firm belongs to create the desired positive impact on the stock price.

Key words : value relevance, creative accounting, stock price sensitivity, accounting information, forensic accounting, earnings management, discretionary accruals, generalised least squares method, firm level

JEL Classification : C3, G3, M41

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Creativity is a requirement to generate new and valued ideas across various business areas, functions, and situations (Al-Beraidi & Rickards, 2006) to ensure sustainability and to address issues on competitive advantage. On the other hand, creativity in the field of accounting has been an issue of concern for players and regulators of financial markets. Increasing pressures of financial accounting disclosures and alertness of financial analysts (Lui, 2014), increasingly informed (not knowledgeable) investor community, heightened competition in the business world, meeting the earnings forecasts (Byun & Roland-Luttecke, 2014 ; Cheung, Luo,

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Tan, Xio, 2014), change in the organization leadership and structure (Lee, Lev, & Yeo, 2007 ; Wells, 2002), and the hostile economic environment are some of the promoting factors for instances of creative accounting. The often cited intention (Chen, Wang, & Zhao, 2009 ; Mariana, 2015 ; Moreira & Pope, 2007 ; Vinciguerra & O'Reilly-Allen, 2004 ; Yang, Hsu, & Yang, 2013) in cases of creative accounting is to present a favourable financial performance to the stakeholders of a firm. In the business press or peer reviewed research articles, creative accounting is highlighted when it is value destroying for any stakeholder, but it goes unnoticed in cases where there is a positive or marginal impact.

Few Latest Instances of Creative Accounting

According to Spellman (2012, paras 3, 4) :

> Deutche Bank and its board is confronting allegations that it failed to recognize ... unrealized losses during the financial crisis. Leveraged super senior securities were treated as if they weren't leveraged. Hewlett Packard's directors are also under attack for allegedly failing to catch earlier serious accounting improprieties - overstated revenues - when acquiring the software firm autonomy.

Apple has avoided millions of dollars in taxes in California and 20 other states. As revealed by Duhigg and Kocieniewski (2012, paras 3,4,10) :

> Apple's headquarters are in Cupertino, California. By putting an office in Reno, just 200 miles away, to collect and invest the company's profits, Apple sidesteps state income taxes on some of those gains. California's corporate tax rate is 8.84 percent. Nevada's? Zero…. Apple was a pioneer of an accounting technique known as the Double Irish With a Dutch Sandwich, which reduces taxes by routing profits through Irish subsidiaries and the Netherlands and then to the Caribbean.

A report by Reuters ("Toshiba accounting errors may be over $800 million - source," 2015, para 4,5,6) on Toshiba informs that :

> The industrial conglomerate has not been able to close its books for the year that ended in March while a third-party committee reviews its past bookkeeping practices in a probe prompted by regulators. It has also skipped its year-end dividend to shareholders. The investigation had previously found inappropriate book-keeping in areas such as highway electronic toll collection systems, power meters and semiconductors likely led to profits being overstated…..The company has said irregularities found so far included not booking appropriate losses and expenses, as well as underestimating material costs.

A report prepared by India Ratings, July (2014), a credit assessor highlights poor quality of financial statements prepared by publicly listed companies in India as reported in Live Mint (2015, para 2). The report stated that there is :

> Significant likelihood that companies, even in the top hundred of BSE 500 companies, could be involved in creative accounting practices. Among all, the pharmaceutical, automobile, and packaged consumer goods sectors remain most

prone. Under-reporting tax liabilities, depreciation, and other costs such as interest, and selling and distribution expenses are some of the techniques used to misreport actual costs; while channel pushing is a favorite tool to create illusory sales that boost revenue.

With no one single definition, and equally varied ways of doing it, the attention of academia is attracted to this phenomenon of creative accounting for the last two decades. Managers are motivated to adopt creative accounting practices to favorably influence the market price of the shares to benefit themselves or a closed group of shareholders. Either they are helpless due to a hostile environment or have a fraudulent intent to engage in creative accounting. This paper is an attempt to re-visit this phenomenon with an integrated perspective. Motivated by the concepts of business strategy like key success factors and firm's strategic response to external business environment, we believe that managers would be interested to manage only those accounting variables which influence prices of shares the most.

This paper empirically verifies the hypothesis whether the sensitivity of market prices of equity shares to chosen accounting variables varies depending upon the business sector to which the firm belongs. Generalized least squares regression in the log-log form with stock prices as dependent variables and the contemporaneous BSE SENSEX as the control variable are undertaken. Book value of equity, revenue, profits after tax, and dividend are the chosen accounting items whose value relevance is examined (independent variables). Sector wise cross sectional regression analysis is performed. To examine the significance of each of the independent variables on the stock price, univariate regression has also been undertaken.

Need for the Study

The review of literature presented in the next section highlights that creative accounting does take place. It also establishes that information contained in the financial statements influences the market value of equity. Most of the empirical works highlight the determinants of the propensity to adopt creative accounting practices and further investigate the impact of such practices on the market value of equity. The studies are cross sectional in nature and are also longitudinal.

Past research has not differentiated firms by their business sectors while examining variables for creative accounting practices. Review of literature also confirms our belief that there are limited numbers of empirical research in the area of creative accounting in the Indian context. The aforementioned gaps identified by the review of literature prompted this exploratory study.

Inspired by integrated approaches to research (Kaplan, 1983), the paper takes cue from key success factors (Kaplan, 1983 ; Rockart, 1979) applied in business performance measurement (Rangone, 1997) and the hypothesis that the sensitivity of market value of equity to certain accounting variables varies across firms belonging to different sectors of businesses (Barth, Beaver, & Landsman, 1998). Accounting information is a major input for the investors to build expectations about future profitability and growth prospects of a business (Bernard, 1994 ; Collins, Maydew, & Weiss, 1997 ; Edwards & Bell, 1961 ; Healy & Wahlen, 1999 ; Ohlson, 1991). It is reasonable to believe that individual investors would focus on earnings, and hence, managers can think that earnings need to be managed. But with institutional investment also playing a significant role, other accounting variables should come under the scanner. Any typical investor is interested in both conservation and growth of wealth. Accounting information provides both stock and flow dimensions of wealth of a business for investors. While earnings and revenue are the flow dimensions, the value of assets and book value of equity are the stock dimensions of the wealth of a business. Ideally, an informed investor should track both these accounting figures. The dominance of price multiples based valuation models (Damodaran, 2007) brought the focus of individual investors onto the book or cash earnings. But certain crucial inputs related to growth prospects lie in the

asset structure, book value of equity, and revenue multipliers, which are more seriously monitored by institutional investors. Since these, other than earnings variables, depend on the nature of business, this study is motivated to empirically examine whether the sensitivity of stock prices to these accounting variables also varies across business sectors.

Literature Review

Creative accounting as a word appeared in the context of bankruptcies in the 1970s and was referred to as accounting choices of management to window dress financial statements. Earnings smoothing, cosmetic accounting, income smoothing, earnings management are synonyms used for creative accounting, which have received adequate research attention of both qualitative and quantitative nature. Barnea, Ronen, and Sadan (1976) used the word smoothing of income ; later, it was more explicitly defined with expressions like, "communicating practices" which present a favourable picture of the economic performance of a business entity (Trotman, 1993). It is the perspective of using flexibility in the accounting standards to 'produce' 'desired accounting results' (Baralexis, 2004 ; Byun & Roland-Luttecke, 2014 ; Cheung et al., 2014 ; Jha, 2013 ; Moreira & Pope, 2007 ; Naser,1993) even when there is a regulatory framework in place to curb such practices (Adrian, Ramona, & Romulus, 2011; Donwa & Odia, 2013; Verma ,2014).

Empirical studies have focused on propensity to creative accounting, identifying the presence of creative accounting (Donwa & Odia, 2013 ; Elisabeta, Lucian, Teodora, & Victoria, 2014) ; propensity to undertake earnings smoothing based on corporate governance (Shan, 2015 ; Weber, 2006) ; sensitivity of executive compensation to stock price (Ke, 2005; Njogu, Gekara, Waititu, & Omido, 2014 ; Weber, 2006 ; Wells, 2002) ; propensity to smooth earnings on the existence of certain dividend thresholds (Daniel, Denis, & Naveen, 2007; Fard, Maimand, & Moradi, 2014 ; Kao, 2014 ; Shuto, 2009) ; sensitivity of stock prices to earnings (Athanasakou, Strong, & Walker, 2011 ; Das, Kim, & Patro, 2011 ; Ke, 2005); external pressures from users of accounting information accentuating propensity to manage earnings (Moreira & Pope, 2007 ; Mariana, 2015) ; presence of valuation allowance on tax deferrals and other regulatory incentives to smooth earnings (Bauman, Bauman, & Hasley, 2000 ; Chen et al., 2009 ; Donwa & Odia, 2013) ; propensity to smooth earnings based on target levels of latent earnings (Koch & Wall, 2000) ; impact of ownership structure, group affiliation, listing on stock market, institutional investment on propensity to smooth earnings (Liu , 2014 ; Yang et al., 2013).

Empirical studies broadly investigated the determinants of propensity to smooth earnings, and the impact of earnings or earnings smoothing on market value of equity. Discretionary accruals were used as a variable for controlling or as a dependent variable since this variable is subject to bias arising out of management perception. In the literature, abnormal changes in discretionary accruals are considered as instances of creative accounting. Primarily practitioners attempt to increase current income followed by expense & loss manipulation and revenue and other gains (Nelson, Krische, & Bloomfield, 2003).

Impact studies have focused on earnings smoothing on audit failure (Modum, Ugwoke, Onyeanu, Modebe, Kodjo, & Odoh, 2014) on stock prices returns (Bar-Yosef & Prencipe, 2013 ; Dimitropoulos & Asteriou, 2009); earnings volatility on stock price (Byun & Roland-Luttecke, 2014 ; Hunt, Moyer, & Shevlin, 2000); discretionary and nondiscretionary accruals on market value of equity (Hunt et al., 2000 ; Koch & Wall, 2000 ; Patro & Pattanayak, 2014); corporate governance reforms and earnings management (Campa & Donnelly, 2014) ; and investor attention and earnings management (Jin, 2013).

The review by Malhotra (2013) represented reasons and ways for creative accounting in two tables. This paper has presented them together without any modifications to the content in the Table 1.

Detecting (Ahmed & Azim, 2015 ; Chen, Chi, & Wang, 2015 ; Patro & Pattanayak, 2014 ; Stubben, 2010), preventing (Alves & Vicente, 2013), requiring (Dye, 1988 ; Liang, 2004), predicting (Jin, 2013), or establishing causal relationships (Aerts & Zhang, 2014 ; Byun & Roland-Luttecke, 2014 ; Cheung et al., 2014 ; Lui, 2014)

Table 1. Acronym for Creative Accounting:

	REASONS		WAYS
C	Choices in Accounting Treatment	A	Abusing Accounting Rules (for Assets, Liabilities, Incomes & Expenditures)
R	Regulatory Flexibility or Dearth	C	Creation of Unreasonable Provisions
E	Ethical Limitations	C	Cognitive Reference Points
A	Attitude to Creative Accounting	O	Overplaying with Extraordinary Items
T	Tax Obligations	U	Use of Artificial Transactions
I	Interest of Managers/Directors	N	Non-Current Assets & Liabilities' Revaluation
V	Volatility & Forecasts	T	Technology & Timing's Misuse
E	Expectations of stakeholders	I	Inside Trading
		N	Non-compliance with the Pre-defined Definitions
		G	Gimmicks

Source: Reproduced from Malhotra (2013)

Table 2. Instances of Creative Accounting- International and National

Year	Organization	How they did it
	International Instances	
1998	Waste Management	Falsely increased the depreciation time length for their property, plant, and equipment on the balance sheets.
2001	Enron	Kept debts off balance sheet.
2002	WorldCom	Under reported line costs by capitalizing rather than expensing and inflated revenues with fake accounting entries.
2002	Tyco	Siphoned money through unapproved loans and fraudulent stock sales. It was taken out of the company disguised as executive bonuses or benefits.
2003	HealthSouth	Asked subordinates to make up numbers and transactions from 1996-2003 and sold his share one day before the company posted huge loss.
2003	Freddie Mac	Intentionally misstated and understated earnings on the books.
2005	American International Group	Allegedly booked loans as revenue, steered clients to insurers with whom AIG had payoff agreements, and told traders to inflate AIG stock price.
2008	Lehman Brothers	Allegedly sold toxic assets to Cayman Island banks with the understanding that they would be bought back eventually. Created the impression Lehman had $50 billion more cash and $50 billion less in toxic assets than it really did.
2014	Toshiba	Overstating of profits due to irregularities in booking appropriate losses and expenses, as well as underestimating material costs.
	INDIAN INSTANCES	
1996	Wipro	Converted fixed assets to stock crediting the excess amounts to reserves.
1999	Larsen & Toubro Ltd.	Income recognition by transfer of loan liabilities at a lower consideration.
2003	Bombay Dyeing	Creating provisions for possible loss on firm purchase contact and subsequently reversed them to record operating profits.
2003	Hindustan Zinc	Reclassifying investments into fixed assets.
2004	ONGC	Capitalization of interest as well as other intangible assets to show increased fixed assets and understating revenue expenses.
2008	Satyam	Falsified revenues, margins, and cash balances.

Source: Soral and Kamra (2013)

of/for earnings management has been done by using various techniques/ models like Hirshleifer and Teoh model (Jin, 2013); causal reasoning on performance (Aerts & Zhang, 2014) ; Bayesian network, principal component analysis, back propagation neural network, and decision tree (Chen et al., 2015) ; Latin model of corporate governance (Alves & Vicente, 2013) ; simulation methods and models (Stubben, 2010) ; Healy model, DeAngelo model, Jones model, and extended modified Jones model (Cheung et al., 2014 ; Lui, 2014 ; Patro & Pattanayak, 2014) ; overlapping generations model (Dye,1988) ; Beinish model (Ahmed & Azim, 2015) ; earnings response models and regression models (Byun & Roland-Luttecke, 2014 ; Cheung et al., 2014 ; Lui, 2014).

A review of reported accounting scandals in the past, both internationally and in the Indian context, are presented in the Table 2.

Methodology, Data Sources, and Model

(1) Choice of Accounting Variables (Independent Variables) : The featured instances in the literature review suggest the following broad ways of managing earnings :

(i) Smoothing revenue by early and delayed booking of sales,

(ii) Clubbing non-operating income or non-core business income with core operating income,

(iii) Delaying expenses to improve profits for better valuation,

(iv) Booking excessive asset maintenance expenditure,

(v) Capitalising expenses to boost profits,

(vi) Showing decreases in settling liabilities or discounts received as income,

(vii) Revaluation of assets,

(viii) Excessive or inadequate provisioning,

(ix) Changing the structure of fixed assets to current assets,

(x) Changing proportion of short-term to long-term liabilities and debt-equity proportions,

(xi) Advancing to near and dear, or confidant dealers to be re-routed as sales revenue,

(xii) Altering depreciation methods frequently,

(xiii) Debt and other claims through off balance sheet vehicles,

(xiv) Building abnormal levels of inventories.

A closer examination reveals that most of the methods target book value based variables rather than cash flow based variables as they restrict the possibility of creative accounting.

In the above mentioned list, (I), (ii), and (xi) are targeted towards understating or overstating revenue; whereas (iii), (iv), (v), (vi), (viii), (xii), and (xiv) are targeted towards adjusting profits ; and (vii), (viii), (ix), (x), and (xiii) are targeted towards manipulation of book value of equity. Any change in the revenue has an impact on profits, adjusted for the offsetting effect of cost. Similarly, any change in the profits passes on to the book value of equity adjusted for the offsetting effect of dividend. Certain instances of capitalization and revaluation may influence the book value directly without any impact on current profits.

(2) Accounting Variables and Stakeholders' Interest : Stakeholders usually monitor specific accounting variables published in the financial statements and absorb the information in arriving at the prices of their equity shares. These specific accounting variables are the target variables for the managers to falsify. Non-owner stakeholders - especially those who have more interest in the cashflows of the company - would be less influenced by book value based and accrual accounting based measures. Stakeholders with ownership rights, and those who

participate in long term wealth creation are largely influenced by the target variables selected for the study.

Revenue of an organization is an indicator of growth and source of profitability. For capital intensive industries, FMCG and service sectors, it is a good measure of efficient asset utilization and sustainability. Profit is a measure of financial efficiency. It is current return and the source of finance for investing in future growth prospects. Firms consolidating their market position in their post break-even phases, blue-chip companies, and fiercely competing companies, are expected to generate profits. A sustained rate of growth in revenue and profits and dividend payout ratio are significant inputs to the models of equity and business valuation. Book value of equity assumes significance in the finance sector, where both assets and liabilities are monetary in nature and are valued at fair market values. The measure of Tobin's Q highlights the importance of book value of equity.

Given this understanding, *three* target variables, that is, book value of equity *(bv)*, revenue *(rev)*, profits after tax (net of prior period and extra-ordinary items) *(pat)* are chosen in this paper to study their impact on the market price of the equity share *(mv)*. Another variable, dividend *(div)* also has been chosen to re-look at its impact on the market price of equity share. The prime argument in this paper is that the impact of these target variables is not uniform across firms operating in different business sectors. The varying degrees of impact of these target variables on the market price of the share is captured using sector wise, cross sectional univariate regressions.

(3) Estimation Model : A log-log form of regression is estimated with market price of a particular company's share is the dependent variable ; *bv, rev, pat,* and *div,* as the independent variables ; and Bombay Stock Exchange's (BSE) SENSEX as the control variable to control for the impact of various macro factors. The regression equations are given below and the construct of the variables is explained in the Table 3.

$$lnmv_{i,t+4} = \alpha + \beta_1 \, lnbv_{i,t} + \beta_2 \, lnind_{t+4} + \varepsilon_{i,t} \qquad ....(1)$$

$$lnmv_{i,t+4} = \alpha + \beta_1 \, lnrev_{i,t} + \beta_2 \, lnind_{t+4} + \varepsilon_{i,t} \qquad ....(2)$$

$$lnmv_{i,t+4} = \alpha + \beta_1 \, lnpat_{i,t} + \beta_2 \, lnind_{t+4} + \varepsilon_{i,t} \qquad ....(3)$$

$$lnmv_{i,t+4} = \alpha + \beta_1 \, lndiv_{i,t} + \beta_2 \, lnind_{t+4} + \varepsilon_{i,t} \qquad ....(4)$$

Data with annual frequency is chosen for the regressions. All the accounting information has been chosen as at the end of each financial year, that is, March 31 st. It is assumed that the July month end prices of equity share of a company, in a particular year, would reflect all the accounting information published as on March 31 st of the same year. The July month end share prices of each year are extracted from the official website of BSE. Assuming contemporaneous impact of the stock market on the stock price, the July month end closing value of BSE SENSEX have been taken.

Table 3. Explanation of Variables

$lnmv_{i,t+4}$	Natural logarithm of the July month *(t+4)* end closing price of the equity share of a company *'i',* following the financial year ending date of 31st March *(t)* of the same year.
$lnbv_{i,t}$	Natural logarithm of the book value of equity (networth) of a company *'i',* as on 31st March *(t)* of a particular financial year.
$lnrev_{i,t}$	Natural logarithm of the total revenue of a company *'i',* as at the end of a 31st March *(t)* of a particular financial year.
$lnpat_{i,t}$	Natural logarithm of profits after tax, net of prior period and extra-ordinary expenses of a company *'i',* as at the end of 31st March *(t)* of a particular financial year.
$lndiv_{i,t}$	Natural logarithm of total dividend declared by a company *'i',* as at the end of 31st March *(t)* of a particular financial year.
$lnind_{i,t+4}$	Natural logarithm of the July month end closing BSE SENSEX following the financial year ending date of 31st March *(t)* of the same year.

The closing price of the equity share of a company has been taken with 4 month lag assuming that the market requires this time for absorbing the financial results of the company declared at the end of the financial year, that is, March 31 st every year.

The initial ordinary least squares (OLS) regressions displayed first order autocorrelation, so the GLS method has been used to correct for the error terms, and to generate a more representative model. The GLS model has a set of equations for each estimation. Equations 1 to 4 are the initial OLS equations, and another equation for each of them is also estimated, as follows, to correct for the first order autocorrelation.

$$\varepsilon_{i,t} = \rho\varepsilon_{i,t-1} + \upsilon_{i,t} \qquad\qquad ....(5)$$
$\varepsilon_{i,t}$ = Residual of each equation estimated for time $'t'$
$\varepsilon_{i,t-1}$ = Residual of each equation estimated for time $'t$-1$'$, where t-1 = immediate previous month

The 'ρ' in the above regression gives the degree of first order autocorrelation observed in the first equation. It is used to transform the variables in the first equation following the principles of GLS. The variables are given the prefix 'tr' to denote that they are transformed. The final equations are as follows :

$$trlnmv_{i,t+4} = \alpha\,(1\text{-}\rho) + \beta_3 trlnbv_{i,t} + \beta_4 trlnind_{i,t+4} + \upsilon_t \quad ....(6)$$
$$trlnmv_{i,t+4} = \alpha\,(1\text{-}\rho) + \beta_3 trlnrev_{i,t} + \beta_4 trlnind_{i,t+4} + \upsilon_t \quad ....(7)$$
$$trlnmv_{i,t+4} = \alpha\,(1\text{-}\rho) + \beta_3 trlnpat_{i,t} + \beta_4 trlnind_{i,t+4} + \upsilon_t \quad ....(8)$$
$$trlnmv_{i,t+4} = \alpha\,(1\text{-}\rho) + \beta_3 trlndiv_{i,t} + \beta_4 trlnind_{i,t+4} + \upsilon_t \quad ....(9)$$

(4) Data Sources : The accounting data of the companies is extracted from Prowess, the Centre for Monitoring Indian Economy (CMIE) database of Indian companies. The market prices and BSE SENSEX values are extracted from the official website of BSE. Banking, IT, Automobile, FMCG, and Pharmaceutical sectors are chosen for the study. Initially, the paper expected to explore all the 30 companies in the SENSEX of BSE, taking cue from the report prepared by India Ratings, 2014 ("Creative accounting in listed companies: Independent directors have failed to protect minority shareholders," 2015), but all companies did not have price and accounting information since 2000. On the basis of availability of the required company information for the required years and to consider diverse sectors for analysis, we identified the sectors and the companies as shown in the Table 4. Twenty two companies in all are taken, of which 12 are represented on the BSE SENSEX Index.

Table 4. The Data Set

Sector	Names of Companies	No. of Companies	Years of Data
Banking	Axis Bank, HDFC Bank, ICICI Bank, State Bank of India	4	2000-2013
Automobiles	Hero Motorcorp, Maruti Suzuki, Mahindra & Mahindra, Tata Motors	4	2003-2013
Information Technology	HCL Technologies, Infosys, TCS, Wipro	4	2005-2013
FMCG	Colgate-Palmolive, Dabur India, HUL, Marico Industries, Godrej Consumer Products	5	2002-2013
Pharmaceuticals	Cadila, Cipla, Lupin, Dr. Reddy's Labs, Sun Pharmaceuticals	5	2000-2013

Source: Compiled from CMIE- Prowess Database

Regression Results, Implications, Scope for Further Research, and Limitations of the Study

(1) Discussion of Regression Results : The problem of first order auto correlation of error terms has been

Table 5. Sector Wise Accounting Variables' Strength in Explaining Market Price

Sector	2 Variables with Highest Coefficient Values	Variable with the Highest Explanatory Power along with SENSEX
Banking	*pat* (0.642)[#]; *bv* (0.583)	*bv* - 78%*
Automobile	*rev* (0.589); *bv* (0.395)	*rev* - 58%*
IT	*bv* (1.098); *pat* (1.003)	*pat* - 89%*
FMCG	*pat* (1.033); *rev* (0.895)	*pat* - 91%*
Pharmaceuticals	*pat* (0.592); *bv* (0.495)	*pat* - 63%*

\# The values in the parentheses are the slope coefficients of the univariate regressions with the respective accounting variable.

* Values of Adjusted R^2 of the equations with the respective accounting variable and SENSEX

Table 6. Summarized Regression Estimates

BANK	Book Value of Equity	Revenue	Profits After Tax	Dividends Declared
Constant	-0.6920 (ns)	-0.4873 (s)	-0.4141 (ns)	-0.1493 (ns)
β_3	0.583 (s)	0.522 (s)	0.642 (s)	0.603 (s)
β_4	0.875 (s)	1.067 (s)	0.861 (s)	0.886 (s)
Adj R^2	0.785	0.631	0.746	0.747
AUTO	**Book Value of Equity**	**Revenue**	**Profits After Tax**	**Dividends Declared**
Constant	0.9286 (ns)	0.3018 (ns)	0.8127 (ns)	0.8752 (ns)
β_3	0.395 (s)	0.589 (s)	0.025(ns)	0.091 (ns)
β_4	0.480 (ns)	0.472 (s)	0.632 (ns)	0.678 (ns)
Adj R^2	0.368	0.575	0.016	0.084
IT	**Book Value of Equity**	**Revenue**	**Profits After Tax**	**Dividends Declared**
Constant	7.673 (s)	6.538 (s)	7.356 (s)	5.630 (ns)
β_3	1.098 (s)	1.025 (s)	1.003 (s)	0.862 (s)
β_4	-0.179 (s)	-0.544 (s)	-0.445 (s)	-.019 (s)
Adj R^2	0.774	.0811	0.890	0.607
FMCG	**Book Value of Equity**	**Revenue**	**Profits After Tax**	**Dividends Declared**
Constant	0.0735 (s)	-0.6660 (s)	-0.8505 (s)	-0.3752 (ns)
β_3	0.079 (ns)	0.895 (s)	1.033 (s)	0.521 (s)
β_4	0.419 (ns)	0.939 (s)	0.588 (s)	1.262 (s)
Adj R^2	0.008	0.680	0.919	0.473
PHARMA	**Book Value of Equity**	**Revenue**	**Profits After Tax**	**Dividends Declared**
Constant	-0.1223 (ns)	0.2397 (ns)	-0.7060 (ns)	0.0888 (ns)
β_3	0.495 (s)	-0.021 (ns)	0.592 (s)	0.364 (s)
β_4	0.778 (s)	1.084 (s)	0.853 (s)	0.924 (s)
Adj R^2	0.438	0.283	0.627	0.410

(s) - Statistically significant, that is, *'p'* values < 0.05 (5% significance level) (ns) - not statistically significant

observed in almost all the initial regressions, except for the regressions on profits after tax of companies of the IT sector. The Appendices 1,2,3,4, and 5 contain the regression results in detail of the initial OLS regressions and the

error corrected GLS regressions. The Table 5 provides a summarized view of the results for analysis and the Table 6 provides the information on all the parameters along with Adj R^2. The results are discussed sector wise in the following paragraphs.

In general, all the accounting variables have been found to be statistically significant in all the regressions, with profits after tax and book value of equity being consistent, as found by Collins et al. (1997). However, keeping in tune with our hypothesis and the practical relevance of the value of the coefficients, variables with maximum impact on the share price have been chosen for each sector for discussion. Further, the adjusted R^2 of each equation is considered to substantiate a particular accounting variable for its combined explanatory power, along with SENSEX. While multicollinearity might be an issue with more than two independent variables in a regression, in most of the cases, the VIF is less than 2.

The Table 5 depicts the two most significant variables (statistically significant accounting variable with the largest slope coefficient value) and that accounting variable which along with the SENSEX has the highest explanatory power of stock prices (measured by adjusted R^2). The Table 6 presents the summarized regression estimates.

(2) Hypothesis Verified : As hypothesized, the sensitivity of stock prices of firms varies depending on the business sector to which the firm belongs.

The variation in sensitivity of stock prices can be explained in two ways : one, based on the value of the slope coefficient and, two, based on the specific accounting variable in a particular sector. The value of the most significant accounting variable in the case of Banking, Automobiles, and Pharma sectors is around 0.6 on an average and 1 in the case of IT and FMCG sectors. Profits after tax and book value of equity in Banking ; revenue in Automobiles ; profits after tax and revenue in IT ; profits after tax and revenue in FMCG ; and profits after tax in Pharmaceuticals are the dominant influencing accounting variables on the stock prices.

(3) Sectorwise Discussion of Regression Results with Practical Implications: In the case of the Banking sector, the constants carry a negative sign and in only the revenue regression, it is significant. All the accounting variables are statistically significant at the 95% confidence interval. SENSEX is also statistically significant in all the regressions, with an average estimate of 0.85. The profits after tax display the highest impact on the price of shares ($\beta_3 = 0.642$), followed by the book value of equity ($\beta_3 = 0.583$). On the basis of combined explanatory power along with SENSEX, the book value regression explains around 78.5% of the change in the price of a banking stock, when compared to around 75% as in the case of profit after tax regression. SENSEX along with any one of the chosen accounting variables does not explain more than 79% of the change in market price of banking stocks. The relative dominance of SENSEX variable over the accounting variable is explained by the fact that Banking is a financial service industry and its fortunes depend on the business sector. Corporate and personal products of the banking industry do well during times of economic prosperity.

In the case of the Auto sector, all the constants carry a positive sign, but none of them is statistically significant. Of the four accounting variables, only book value of equity and revenue are found to be statistically significant. Between them, revenue has a higher coefficient ($\beta_3 = 0.589$) compared to that of book value ($\beta_3 = 0.395$). The combined explanatory power of revenue is higher (Adj $R^2 = 0.575$) than that of book value of equity (Adj $R^2 = 0.368$). The control variable, SENSEX is not statistically significant in any of the regressions. Looking at the low adjusted R^2 of all the regression equations, it is clear that there are other omitted variables which are influencing the share prices of auto stocks rather than SENSEX and any one of the chosen accounting variables. Revenue as the dominant accounting variable can be explained by the fact that in India, with the increased competition among brands, especially passenger cars, top lines have become extremely crucial for the long term survival of the firms. With significant investments in the production capacities in the country, it is essential that they sell to generate profits. With a fiercely competitive market, prices cannot be altered to improve margins.

The IT sector results are very interesting, in the sense that they have displayed lesser auto correlation. The constants are significant in case of book value of equity, revenue, and profits after tax regressions. Of all the accounting variables which are significant at the OLS stage, profits after tax has the highest coefficient (β_1 = 1.003) and along with SENSEX, it explains 89% of the change in the price of the stock. Running GLS regressions with the other accounting variables, the constants have turned negative and become statistically insignificant. All the three accounting variables show statistical significance with revenue carrying the highest coefficient of β_3 = 0.955 and an Adj. R^2 of 0.742. The sign of the coefficients of SENSEX in the OLS regressions have been counter-intuitive, that is, they have displayed negative coefficients with statistical significance. But they turned insignificant in the GLS regressions except in the case of dividend regression. One of the interpretations to the counter intuitive SENSEX coefficients can be that a declining SENSEX is a weakness in the domestic economy and industry, leading to depreciation in exchange rate of Indian Rupee. The IT industry of India, being a predominantly export oriented industry, tends to gain from such depreciation since its revenues and profits on conversion would increase, leading to an increase in the prices of their stocks ; similarly, the fortunes of Indian IT companies are more wedded to the OECD and other developed nations, whose CAPEX or maintenance on IT is the revenue of Indian IT companies.

In the case of the FMCG sector, the regressions of revenue and profits after tax have shown negative constants with statistical significance. Further, these two accounting variables impact the share prices the most. The revenue coefficient is 0.895 and the profit after tax coefficient is 1.003. The combined explanatory power along with SENSEX is highest for the profits after tax regression with an Adj R^2 of 0.919. SENSEX is significant in revenue, profits after tax, and dividend regressions. The case of FMCG is very interesting to interpret. The negative and statistically significant constants suggest that if the firms do not show any change in their revenues or profits after tax, the prices of their shares would fall down. This is quite in consonance with the general strategies of FMCGs which pitch brands into the market to acquire as much market share as possible.

None of the constants of the Pharma sector regressions are statistically significant. Book value of equity, profit after tax, and dividends are statistically significant with the highest regression coefficient, that of profits after tax (β_3 = 0.592). The combined explanatory power of the profits after tax regression is also the highest with Adj. R^2 of 0.627. The relatively lower impact on the share price suggests that there are omitted variables which explain the changes in the prices of pharma stocks. SENSEX is a significant variable in all the regressions with an average value of 0.9. This is due to the fact that the companies chosen for the study are well established and also enjoy regular trading. The significant impact of profits after tax is explained by the fact that R&D is the cornerstone of any pharma industry for long term sustenance. Ploughing back profits for R&D is ideal for any pharma industry, so large profits might be signalling higher capabilities for R&D.

(4) Practical Implications : The practical implications of the results displayed in Tables 5 and 6 are summarized in this section. A given 1% change in the value of the most significant accounting variable leads to a 0.6% change in the share prices of Banking, Automobiles, and Pharma sector stocks, and around 1% change in the share prices of IT and FMCG sector stocks. Since all the coefficient values are positive, any kind of creative accounting practice which can enhance the value of these relevant accounting variables will lead to an increase in the stock prices. For instance, if a banking firm increases the book figure of profits after tax by 1% adopting a creative accounting technique, it can hope for a 0.642% increase in its share price. On the other hand, since enhancing the book value of its equity leads to only 0.583% increase in the share price, the propensity to influence the book profits would be more in the case of the banking industry. There is nothing which can prevent a banking firm to adopt both. Similarly, the automobile industry would be motivated to prominently announce increases in revenue to create a greater impact on the share price (0.58% for a 1% increase in revenue).

This is a new perspective to the literature on creative accounting, but earlier, Barth et al. (1998) and Collins et al. (1997) found the same in the context of value relevance of accounting information. So, it was not

possible to discuss other studies and their findings in this aspect.

This approach integrates the dimensions like market players' response to accounting information, value relevance of accounting information, influence of the business sector on the choice of accounting variable for creative accounting, and finally, the manager's propensity. This integration is prompted by the premise that there are certain key financial indicators for each business sector, which act as lead indicators for its future prosperity and growth. Market players know these indicators and extract the relevant information from corporate disclosures. Managers also understand this and they are motivated to manoeuver these indicators. So, effectively, this paper reiterates that the choice of a target variable for creative accounting manipulation depends on the business sector and earnings or profits is not the *only* target variable. This paper is an exploratory study in this direction and we are working to explore a more comprehensive framework, with more industries and companies, and consistent target variables.

(5) Implications : The above findings have implications for investment analysts, accounting professionals, and regulators. Analysts who normalize accounting data for valuation exercises can be benefitted by the findings. They would choose the appropriate variables to normalize depending on the business sector. Additionally, this study re-affirms the need for sector specific price multiples for relative valuation methods. For accounting professionals, especially for those who vouch for the authenticity of the data and process of preparation of financial statements, the findings help to identify the areas of greater focus while undertaking both internal and statutory audits, to better qualify their reports. Similarly the above findings can lead the forensic accounting investigators to locate creative accounting attempts. With more research and persistent findings, the standard setting bodies, the investor protection agencies, and the capital market regulatory bodies may bring in more ingenuous, business sector specific disclosures for early detection of disastrous creative accounting. A non-jargonised visual presentation of integrated analytics encompassing the key success factors may be suggested as part of the annual reports, which would act as a deterrent on malafide creative accounting attempts, and also as an ideal investor education tool.

(6) Scope for Further Research : Extending the work adding other sectors, more companies, identifying other significant influencing accounting variables, and exploring for time varying nature of value relevance are some of the possibilities for further research. Using panel data models with GMM methodology, more robust results can be obtained. The time varying nature of the coefficients depending on general economic conditions and strategic, structural changes in the firms themselves can also be examined. There are many other possibilities for cross functional research by mapping the key result areas (KRAs) or KSFs of firms and the correlation to specific accounting variables being maneuvered.

(7) Limitations : Needless to state, this is a study with a limited sample of firms. Though 13 years of data is considered, the context is limited to five industries. Since this is a part of ongoing research, this exploratory study is only a trigger for further robust research. Less number of companies under each business sector, and absence of out of sample robustness verifications are some of the limitations of this study. Similarly, the impact of considering all the accounting variables together in a multivariate regression has not been explored. The survival bias of firms has been taken care of as part of the sampling process to arrive at the final data set. We hope that future research in this regard can bring in more robustness to address these limitations.

Conclusion

Creative accounting, also referred to as earnings management, has become an important agenda in the

professional, academic, and regulatory circles related to the field of financial accounting. Creative accounting is as subtle as its name. It is difficult to identify, and complex to comprehend. The impact which it can create, operating within the constraints of legalities, has been adequately highlighted in the literature. Its complexity and ingenuity makes it difficult to be brought into a conceptual framework for academic learning. Each episode of creative accounting is unearthed only in the post facto analysis, with a forensic approach to financial accounting. By and large, the trends observed suggest that firms adopt creative accounting to dress up revenue, profits after tax, and book value of equity to the occasion, that is, the annual publication of financial accounts. Empirically, it is established that these variables influence the market price of the share in the form of price multiples. This paper further shows that the value relevance of financial accounting information varies across firms depending on the business sectors they operate in. Regressions of natural logs of equity share prices (as dependent variables) of public listed companies in the Banking, Auto, IT, FMCG, and Pharma sectors on the lagged natural logs of accounting variables (as explanatory variables) and contemporaneous natural log of BSE's SENSEX (as the control variable) are performed. Owing to first order auto-correlation in these time series regressions, the GLS method is taken up for correcting the errors and to arrive at BLUE estimates of the coefficients.

It is verified that accounting information has value relevance in the sense that it influences the share price. Profits after tax is the most dominating accounting variable with a considerable influence on share prices. However, revenue is relatively more significant in the IT, FMCG, and Pharma sectors, and it is the only significant variable in the automobile industry. Book value of equity influences share prices the most in the Banking sector.

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Appendix 1. Regression Results of Banking Sector

Sectors	Parameter	lnbv	lnrev	lnpat	lndiv
Banking-OLS*	α	-2.012	-3.831	-1.238	0.195
		(0.017)	(-4.014)	(-1.378)	(0.202)
		[0.017]	[0.000]	[0.174]	[0.841]
	$β_1$	0.6279	0.595	0.717	0.756
		(11.734)	(8.841)	(10.568)	(10.368)
		[0.000]	[0.000]	[0.000]	[0.000]
	$β_2$	0.717	1.009	0.737	0.66
		(5.594)	(7.228)	(5.300)	(4.492)
		[0.000]	[0.000]	[0.000]	[0.000]
	Adj. R^2	0.914	0.875	0.900	0.898
	DW Stat	1.151	0.753	1.044	0.971
	VIF	2.200	1.791	2.233	2.430
Banking - GLS**	**Parameter**	**trlnbv**	**trlnrev**	**trlnpat**	**trlndiv**
	α	-1.276	-1.305	-0.833	-0.307
		(-1.1916)	(-1.999)	(-1.254)	(-0.466)
		[0.061]	[0.051]	[0.216]	[0.643]
	$β_3$	0.583	0.522	0.642	0.603
		(6.153)	(3.792)	(5.346)	(5.457)
		[0.000]	[0.000]	[0.000]	[0.000]
	$β_4$	0.875	1.067	0.861	0.886
		(4.889)	(5.319)	(4.354)	(4.625)
		[0.000]	[0.000]	[0.000]	[0.000]
	ρ	0.4577	0.6266	0.5029	0.5136
	Adj. R^2	0.785	0.631	0.746	0.747
	DW Stat	2.279	2.444	2.347	2.364
	VIF	1.837	1.356	1.907	1.796

* OLS - Ordinary Least Squares method; ** GLS - Generalized Least Squares method. The values in the brackets are the *t*-stat values at 95% confidence interval, and the values in the square brackets are *p* - values.

Appendix 2. Regression Results of Automobile Sector

AUTO - OLS*	Parameter	lnbv	lnrev	lnpat	lndiv
	α	0.505	-1.324	0.829	0.882
		(0.566)	(-1.569)	(0.811)	(0.875)
		[0.574]	[0.124]	[0.422]	[0.387]
	β_1	0.337	0.602	0.153	0.129
		(3.792)	(5.744)	(1.347)	(1.766)
		[0.000]	[0.000]	[0.185]	[0.085]
	β_2	0.861	0.667	1.066	1.100
		(6.285)	(5.181)	(6.401)	(8.380)
		[0.000]	[0.000]	[0.000]	[0.000]
	Adj. R^2	0.809	0.857	0.753	0.760
	DW Stat	1.116	1.317	0.752	0.783
	VIF	2.086	2.458	2.379	1.525
AUTO - GLS**	Parameter	trlnbv	trlnrev	trlnpat	trlndiv
	α	1.825	0.470	2.279	2.169
		(1.500)	(0.424)	(1.603)	(1.574)
		[0.142]	[0.674]	[0.116]	[0.124]
	β_3	0.395	0.589	0.025	0.091
		(3.062)	(4.144)	(0.235)	(0.892)
		[0.004]	[0.000]	[0.815]	[0.378]
	β_4	0.480	0.472	0.632	0.678
		(1.628)	(2.046)	(1.606)	(1.859)
		[0.112]	[0.048]	[0.117]	[0.071]
	ρ	0.4912	0.3578	0.6434	0.5965
	Adj. R^2	0.368	0.575	0.016	0.084
	DW Stat	1.736	1.765	1.737	1.743
	VIF	1.417	1.701	1	1.080

* OLS - Ordinary Least Squares method; ** GLS - Generalized Least Squares method. The values in the brackets are the t-stat values at 95% confidence interval, and the values in the square brackets are p - values.

Appendix 3. Regression Results of IT Sector

Sectors	Parameter	lnbv	lnrev	lnpat	lndiv
IT-OLS*	α	7.673	6.538	7.356	5.630
		(3.310)	(3.149)	(4.618)	(1.882)
		[0.002]	[0.003]	[0.000]	[0.069]
	β_1	1.098	1.023	1.003	0.862
		(9.547)	(10.829)	(14.997)	(6.263)
		[0.000]	[0.000]	[0.000]	[0.000]
	β_2	-0.179	-0.544	-0.445	-0.019
		(-2.319)	(-2.032)	(-2.267)	(-0.052)
		[0.027]	[0.050]	[0.030]	[0.959]
	Adj. R^2	0.774	0.811	0.890	0.607
	DW Stat	1.340	1.456	2.076	1.394
	VIF	1.787	1.615	1.491	1.441
IT - GLS**	**Parameter**	**Trlnbv**	**trlnrev**	**trlnpat**	**trlndiv**
	α	-2.525	-4.704		-6.974
		(-0.663)	(-1.296)		(-1.615)
		[0.512]	[0.205]		[0.117]
	β_3	0.943	0.955		0.762
		(7.033)	(7.864)		(6.245)
		[0.000]	[0.000]		[0.000]
	β_4	0.634	0.862		1.557
		(1.005)	(1.574)		(2.691)
		[0.323]	[0.126]		[0.012]
	ρ	0.3116	0.2562		0.2028
	Adj. R^2	0.706	0.742		0.651
	DW Stat	1.567	1.482		1.575
	VIF	1.329	1.220		1.079

* OLS - Ordinary Least Squares method; ** GLS - Generalised Least Squares method. The values in the brackets are the *t*-stat values at 95% confidence interval, and the values in the square brackets are *p* - values.

Appendix 4. Regression Results of FMCG Sector

FMCG - OLS*	Parameter	lnbv	lnrev	lnpat	lndiv
	α	-1.532	-6.097	-0.884	-1.821
		(-0.702)	(-8.076)	(-1.667)	(-1.931)
		[0.486]	[0.000]	[0.101]	[0.058]
	β_1	0.027	1.056	1.052	0.774
		(0.765)	(21.565)	(30.224)	(15.814)
		[0.448]	[0.000]	[0.000]	[0.000]
	β_2	1.347	0.721	0.412	0.802
		(5.715)	(8.645)	(6.315)	(7.448)
		[0.000]	[0.000]	[0.000]	[0.000]
	Adj. R^2	0.355	0.929	0.962	0.879
	DW Stat	0.308	0.594	1.145	0.841
	VIF	1.01	1.147	1.305	1.123
FMCG - GLS**	Parameter	trlnbv	trlnrev	trlnpat	trlndiv
	α	0.778	-2.089	-1.358	-1.284
		(2.260)	(-2.754)	(-2.158)	(-1.435)
		[0.028]	[0.008]	[0.036]	[0.157]
	β_3	0.079	0.895	1.003	0.521
		(0.902)	(8.799)	(19.557)	(5.440)
		[0.371]	[0.000]	[0.000]	[0.000]
	β_4	0.419	0.939	0.588	1.262
		(1.398)	(3.782)	(4.987)	(4.073)
		[0.168]	[0.000]	[0.000]	[0.000]
	ρ	0.9055	0.6812	0.3737	0.7078
	Adj. R^2	0.008	0.680	0.919	0.473
	DW Stat	1.945	2.080	2.125	1.893
	VIF	1.025	1.071	1.246	1.008

* OLS - Ordinary Least Squares method; ** GLS - Generalised Least Squares method. The values in the brackets are the *t*-stat values at 95% confidence interval, and the values in the square brackets are *p* - values.

Appendix 5. Regression Results of Pharma Sector

Sectors	Parameter	lnbv	lnrev	lnpat	lndiv
Pharma - OLS*	α	-1.199	-3.377	-0.300	1.597
		(-1.111)	(-2.760)	(-0.292)	(1.205)
		[0.271]	[0.007]	[0.771]	[0.232]
	β_1	1.020	1.089	0.878	0.935
		(8.341)	(6.053)	(9.473)	(6.865)
		[0.000]	[0.000]	[0.000]	[0.000]
	β_2	0.273	0.409	0.483	0.379
		(1.439)	(1.797)	(3.120)	(1.806)
		[0.155]	[0.077]	[0.003]	[0.075]
	Adj. R^2	0.777	0.706	0.805	0.733
	DW Stat	0.869	0.769	1.415	0.860
	VIF	2.670	2.910	2.031	2.727
Pharma- GLS**	**Parameter**	**trlnbv**	**trlnrev**	**trlnpat**	**trlndiv**
	α	-0.278	0.657	-0.988	0.204
		(-0.366)	(0.751)	(-1.038)	(0.272)
		[0.716]	[0.455]	[0.303]	[0.786]
	β_3	0.495	-0.021	0.592	0.364
		(2.834)	(-0.098)	(4.255)	(2.287)
		[0.006]	[0.922]	[0.000]	[0.026]
	β_4	0.778	1.084	0.853	0.924
		(3.392)	(4.827)	(4.503)	(4.305)
		[0.001]	[0.000]	[0.000]	[0.000]
	ρ	0.5601	0.6352	0.2854	0.5648
	Adj. R^2	0.438	0.283	0.627	0.410
	DW Stat	2.285	2.017	1.775	2.223
	VIF	1.643	1.118	1.729	1.369

* OLS - Ordinary Least Squares method; ** GLS - Generalised Least Squares method. The values in the brackets are the *t*-stat values at 95% confidence interval, and the values in the square brackets are *p* - values.