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Abstract

Purpose – The purpose of this paper is to examine whether the stock market in India is efficient in the semi-strong form.

Design/methodology/approach – The study uses financial and stock market data of 1,135 listed Indian companies (non-financial) during 2003–2011 collected from Capital IQ to estimate discretionary accruals (DA) using modified Jones model (1995). The study also examines using the widely used Mishkin (1983) test to whether equity market prices accruals in India. The study is conducted for profit/loss-making firms separately as well as for a hedge portfolio of firms based on the lowest to highest accruals.

Findings – The empirical study of DA of 1,135 listed Indian companies (non-financial) during 2003–2011 shows that the estimated average DA of the corporate sector in India comes to 1 percent of the total assets of these firms. An empirical analysis whether equity market prices DA in India finds no evidence of investors/market pricing DA. Empirical evidence also finds that the results are invariant for profit/loss-making firms as well as portfolio of firms based on the lowest to highest accruals in the Indian context. The empirical evidence shows that the Indian equity market is inefficient with regard to the incorporation of accruals in expected returns of stocks.

Research limitations/implications – This study builds on the previous literature on accrual pricing in the context of the USA and developed markets. The study extends the empirics to the one of the largest emerging market economy – India. This issue is important not only to investors, but also to policy makers and researchers because the mispricing of accruals could potentially lead to misallocation of capital. The study has implications for stock/firm valuations and cost of equity/capital.

Originality/value – This is the first study for the pricing of accruals and test of semi-strong efficiency of the Indian stock market.

Keywords Market efficiency, Accrual anomaly, Indian stock market

Paper type Research paper

1. Introduction

Accounting principles provide managers considerable discretion in managing earnings. Earnings management (EM) is possible either by manipulating accruals (more by altering DA[1]) or by manipulating real activities (operational activities)[2]. Accruals are adjustments which accountants/managers which cause book earnings to differ from cash earnings (Dechow *et al.*, 1995). The numerous scandals at the global level, especially the high-profile cases like Enron, WorldCom, Parmlat, Waste Management, Olympus, etc., and Satyam in India, have shown how managers managed earnings to meet market expectations or derive rents in the form of executive compensation. DA is widely considered as a proxy for EM. India has seen its own massive EM episodes. In 2009, Mr B. Ramalinga Raju, the Chairman and founder of Satyam Computer Services, a firm listed in US NASDAQ stock exchange, revealed a $2,260m fraud that he had perpetuated over the prior five years (2003–2008) (Mohapatra *et al.*, 2015). Satyam was listed in both Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) when it became public in 1991; it was also listed in NASDAQ in 1999 and in NYSE in 2001 (Chakrabarti and Sarkar, 2010). In his confession letter to the BSE, Mr Raju famously states that the five years of falsifying Satyam's

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accounts was "[…] like riding a tiger, not knowing how to get off without being eaten." Episodes like Satyam raises questions on how reliable is financial information reported by firms in emerging market economies (Li *et al.*, 2014).

One of the hotly debated issues is whether investors/market has the ability to process cash flow and accrual components of earnings information. The debate is centered on the issue whether market is able to isolate information related to cash flows and accruals. Research by Sloan (1996) shows that stocks of high accrual firms earns negative abnormal returns in the subsequent periods. Fama and French (2008, 2015) identify accrual anomaly as one of the widely prevalent financial anomalies. The accrual anomaly is widely interpreted as evidence of market inefficiency.

How does market react to accrual and cash flow component of earnings is an actively researched question. But most of the empirical studies are in the context of developed countries, and there is very little work with respect to emerging market economies. The study by Pincus *et al.* (2007) showed that cash flows and accruals are often undervalued in emerging economies. The subsequent study by Chen *et al.* (2010) in the context of Taiwan also confirms these conclusions – the use of DA to manage earnings is pervasive and investors tend to lose confidence in accounting earnings and thus tend to under-value earnings. This is inconsistent with the predictions of efficient market hypothesis (Fama, 1991). The study by Cupertino *et al.* (2012) with regard to Brazil (non-financial firms), on the other hand, confirms that the market correctly prices both accruals and cash flows. This conflicting evidence on accrual anomaly warrants a fresh look at the empirics especially in the context of emerging market economies like India. We examine this issue in the context of India which, in recent years, is the fourth best-performing stock market in the world[3] and is unique in terms of ownership structure, investor participation and long institutional reform process to enhance market efficiency (Dash and Mahakud, 2013, 2015; International Monetary Fund, 2013). The country is still based on Indian GAAP accounting standards, which provide considerable latitude for managers at arriving at the final earnings number and thus hide the underlying financial condition of the firm. Available evidence on testing stock market efficiency (weak form) finds that Indian stock market do not follow random walk, i.e. it is inefficient (Gupta and Basu, 2007; Thomas and Kumar, 2010; Harper and Jin, 2012).

Although studies have documented the extensive EM in Indian financial and non-financial firms (Shen and Chih, 2005; Sarkar *et al.*, 2008; Rudra and Bhattachararjee, 2012; Dayanandan *et al.*, 2014), there is no attempt so far to study in the Indian context whether investors/market participants digest, process and impound the information of DA into subsequent equity prices (using a sample of 1,135 Indian firms listed in Indian stock exchanges for the period 2003–2011). In that sense, the study could be considered as a test of the efficient market hypothesis in its semi-strong form - the prices of the assets traded fully reflect available information. Secondly, this issue is important to investors as it provides an arbitrage opportunity- buying firms with high quality earnings and shorting firms dependent on accruals could be profitable opportunity. Thirdly, this issue is important for policy makers and researchers because the mispricing of accruals could potentially lead to misallocation of capital. Available evidence on testing stock market efficiency (weak form) finds that Indian stock market does not follow random walk i.e., it is inefficient (Gupta and Basu, 2007; Thomas and Kumar, 2010; Harper and Jin, 2012).The main purpose of this study is to examine whether accrual anomaly exists in emerging market economy like India where predominantly retail participants dominate[4] and family-dominated ownership structure. This is the first study in the Indian context which examines the semi-strong market efficiency (that all publicly available information is reflected in stock prices) of Indian stock market. The study has implications not only for gauging stock market efficiency but also stock/firm evaluation, cost of equity/capital etc. Since prior research has documented conditions under which managers have an incentive to exceed or meet certain prominent

psychological thresholds (like zero profits), we also conduct separate empirical analysis for profit and loss making firms (Burgstahler and Dichev, 1997; Degeorge *et al.*, 1999). Furthermore, empirical test is also conducted for a hedge portfolio's (based on lowest to highest accruals) to test the presence of accrual anomaly. The study is organized as follows: Section II reviews the literature on the subject and develops hypotheses for empirical testing. Section III discusses the database and methodology for the study. Section IV presents the empirical results and Section V summarizes the conclusions from the study.

2. Review of literature and hypothesis development

The accruals anomaly was first documented by Sloan (1996) and it refers to the negative relationship between accounting accruals and abnormal stock returns over the following year. Using a sample of NYSE/AMEX firms over the period 1962-1991, Sloan (1996) finds that the market fails to recognize that the accrual component of earnings is less persistent than the cash flow component which he attributes to "investor naivety." Sloan (1996) also shows that hedge-trading strategies based on purchasing low accrual firms and selling high accrual firms, generate positive risk-adjusted abnormal returns of 11.2 percent annually. Research by Subramanyam (1996), Xie (2001) and others show that capital markets is fixated on current earnings and failed to fully price the information contained in the accrual and cash components implying cognitive limitations of investors/market participants to process sophisticated financial information. This relationship labeled "the accrual anomaly" holds irrespective of alternative definitions of accruals (Xie, 2001; Hribar and Collins, 2002) and considerations of additional risk/mispricing factors (Collins and Hribar, 2000; Mashruwala *et al.*, 2006). Teoh *et al.* (1998a, b) and Rangan (1998) show that managers choose positive abnormal accruals to opportunistically increase earnings before initial public offerings or seasoned equity issues and the market overprices these abnormal (discretionary) accruals.

Subsequent research has also focused whether accrual anomaly is a value-glamour effect. The study by Desai *et al.* (2004) finds that the existence of accrual anomaly depends on how value-glamour effects are measured. If the value-glamour is defined as cash flow from operations to price, then value-glamour effects explain the returns implications of accruals. But if the traditional proxies like book-to-market or earnings-to-price is used, then accrual anomaly exists.

In recent times, there are alternative explanations on the accrual anomaly. Fairfield *et al.* (2003) argue that accrual anomaly is a special case of growth anomaly. Fairfield *et al.* (2003) point out that accruals are a component of both performance (ROA) and growth in net operating assets. The prospects of net operating assets could be diminished because of diminishing marginal returns to new investment. Hence, accrual mispricing could result in variations in net operating assets. Kothari *et al.* (2006) explain accrual anomaly in terms of overvalued equity rather than investors' fixation on accruals. Dechow *et al.* (2008) explain the difference in time-series behavior of cash flows and accruals due to diminishing returns to investment. A related explanation is the study by Wu *et al.* (2010) based on the q-theory, i.e. adding an investment factor into standard factor regressions reduces substantially the magnitude of accrual anomaly. Wu *et al.* (2010) argue that firms optimally adjust their accruals in response to discount rate changes: a higher discount rate means less profitable investments and lower accruals. Similarly, a lower discount rate means more profitable investments and higher accruals. Hirshleifer *et al.* (2011) attribute arbitrage not eliminating accrual mispricing due to constraints on short selling. Ball *et al.* (2016), in their recent study, argue that a measure of cash-based operating profitability (excluding accruals) outperforms operating profitability in explaining the cross-section of expected returns in the USA and subsumes accrual anomaly. In fact, cash-based operating profitability explains expected return as far as ten years ahead. Peng *et al.* (2016) attribute the disconnect between future stock prices and accruals due to higher heterogeneity in investor beliefs (proxied by

dispersion in analysts' one-year ahead earnings forecast made in the month following the earnings announcement date scaled by the absolute value of the average earnings forecast) following a larger increase in accounting accruals. Hui *et al.* (2016), on the other hand, attribute accrual anomaly to non-recognition of industry-wide component of earnings in stock prices. Hui *et al.* (2016) argue that market significantly underweights the persistence of industry-wide cash flows and overweights the persistence of firm-specific accruals.

If the market is efficient, accrual anomaly provides opportunity for arbitrage and trading. This should result in profits on account of accrual anomaly vanishing over time. Lev and Nissim (2006) examine this question and found that this anomaly still exists in the USA. They explain the existence of anomaly in terms of small magnitude (0.2–0.3 percent of ownership change) of institutional trades to accrual information. Mashruwala *et al.* (2006) also found that the anomaly exists as they are concentrated in firms with high idiosyncratic stock return volatility which makes it risky for risk-averse arbitrageurs. Ali *et al.* (2008) find that mutual funds trade on accrual anomaly; top 10 percent of mutual funds make a significant profit net of actual transactions' costs of 2.83 percent per year. But, the recent research by Green *et al.* (2011) shows that accrual anomaly has decayed or almost disappeared in the USA (for data extended up to 2010) which they attribute to increase in the amount of capital invested by hedge funds in extreme accrual firms. Battalio *et al.* (2012) find that those who trade on accrual information have insufficient market power to mitigate the accrual anomaly.

The abovementioned studies focus on primarily the USA. In a pioneering study, Pincus *et al.* (2007), in an international setting, show that accrual overweighting occurs in countries like Australia, Canada and UK, which they attribute to EM. Papanastasopoulos (2014) also finds that the accrual effect occurs in 11 European capital markets: Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and UK. The study by Chen *et al.* (2010) in the context of Taiwan also confirms these conclusions – the use of DA to manage earnings is pervasive, and investors tend to lose confidence in accounting earnings and thus tend to under-value earnings. El Mehdi's (2011) study of the Tunisian market for the period 1996–2008 finds that earnings and their cash flow and accrual components are not rationally proceeded by the market. Similarly, for Australia, the empirical evidence supports the existence of accrual anomaly in Australia (Clinch *et al.*, 2012). The Indian stock market is characterized by low liquidity and dominated by family ownership (Khanna and Palepu, 2000). Family ownership provides opportunities to control affiliated firms, although they have a small proportion of total stake in these firms. Studies have shown that family ownership facilities in India are "self-dealing" and "tunneling," which are at the expense of minority shareholders (Bertrand *et al.*, 2002; Gopalan *et al.*, 2007). Besides, the Indian stock market has high retail investor participation – retail investors account for 97 percent of total investors in Indian mutual funds (Chandrasekhar *et al.*, 2016). The extant literature has shown that retail investors are predominantly noise traders (Barber and Odean, 2013). Given the extant evidence of a high family ownership structure in the corporate sector in India and predominant retail investor participation in stock market by generally noise traders, one would expect very little correlation between earnings, accruals and future stock prices in India. Given this extant literature, it is hypothesized that:

H1. Accruals are not rationally priced in emerging markets where stock markets are relatively inefficient.

Dopuch *et al.* (2010), using a sample of US firms, find that accrual overpricing is confined to profit-making firms. Among the emerging markets, the study by Li *et al.* (2011) based on Chinese data found evidence of accrual anomaly in China as well (if one eliminates "big bath" firm years). Therefore, it is hypothesized that:

H2. Accruals are priced for profit-making firms.

The present study contributes to the literature on accrual pricing by examining whether investors/market prices DA in an emerging market economy like India, which has not been attempted so far. The tests are an empirical validation of the semi-strong version of market efficiency in an Indian context. The study also conducts analysis separately for profit-making and loss-making firms as well as for portfolio of firms based on total and DA (from lowest to the highest) firms so as to test the presence of the accrual anomaly in the Indian context.

3. Database and methodology

Database

The focus of the present study is non-financial publicly-listed Indian companies. Financial institutions (SIC codes from 6000 to 6999) were excluded because of their different dynamics in EM and is consistent with the literature in this area. In order to capture the overall picture of the Indian corporate sector, the investigation started with around 4,000 publicly listed companies available on S&P Capital IQ (CIQ)[5]. Financial data were collected initially for the period 2003–2011. Since the quality of financial data has varied substantially over a period of time, our endeavor was to obtain comparable panel data for which empirical investigations could be conducted. Since we could obtain comparable financial data for 1,135 firms in India (which is the largest in the empirical investigation so far[6]) for the period 2003–2011, we focused our empirical investigation on this period .We excluded data from 2012 onwards due to the non-availability of comparable data for the firms in the sample. The market capitalization of 1,135 publicly firms in 2011 account for more than four-fifth of the market capitalization of firms listed in the BSE.

Current earnings are a useful indicator for investors to forecast future earnings. But earnings are composed of cash flows and accruals. Sloan (1996) finds that earnings persistence is influenced to a greater degree by the accrual component as accruals are more subjective than cash flows. Accruals could be influenced by intentional actions of managers and is greatly facilitated by accounting policy choices including tax codes. Xie (2001) decomposes accruals into non-discretionary accruals (NDA) and DA and indicates that lower earnings persistence of accruals is primarily due to the role of DA. Total accruals (TA) is the sum of DA and NDA; the component of the accruals that is imposed by the regulators in adjusting firm's cash flow is the DA. The accrual component managers choose within the flexibility of accountings regulations in adjusting a firm's cash flow is the DA (Healy, 1985). NDA, on the other hand, is the level of accruals in the firm, provided that there is no manipulation of earnings. DA is widely considered as a proxy for EM.

Methodology

The main challenge faced by EM researchers is that they are unable to observe EM component of accruals. Empirical investigation in EM has been conducted using various accrual models. There are various models to estimate TA/DA – the Jones Model (Jones, 1991), the modified Jones Model (Dechow *et al.*, 1995), inclusion of ROA in the modified Jones Model (Kothari *et al.*, 2005) and other versions[7].

In the modified- Jones model (Dechow *et al.*, 1995), the estimate of NDA is based on the following equation:

$$NDA_{it} = \alpha_1 \frac{1}{A_{it-1}} + \alpha_2(\Delta REV_{it} - \Delta REC_{it}) + \alpha_3 PPE_{it} + \varepsilon_{it}, \quad (1)$$

where α_1, α_2, and α_3 are firm-specific parameters for year t; ΔREV is the change in revenues scaled by total assets; ΔREC is the change in receivables scaled by total assets; and PPE is the gross property, plant and equipment scaled by total assets.

Estimates of the firm-specific parameters, α_1, α_2, and α_3 are generated using Equation (1) in the estimation period. TA are regressed on the change in sales (ΔREV) and the gross level of property, plant and equipment (PPE) for the panel. Thus, the model is:

$$TA_{it} = a_1\frac{1}{A_{it-1}} + a_2\Delta REV_{it} + a_3 PPE_{it} + \varepsilon_{it}. \quad (2)$$

The descriptions of variables are the same as mentioned in previously discussed equations. a_1, a_2 and a_3 denote the OLS estimates of α_1, α_2 and α_3, respectively. The estimates of α_1, α_2, and α_3 are those obtained from the original Jones Model. The only adjustment relative to the original Jones Model is that the change in revenues is adjusted for the change in receivables in the event period to determine NDA. In the third stage, after computing TA (Equation (2)) and NDA (Equation (1)), DA is computed using the following equation:

$$DA_{it} = TA_{it} - NDA_{it} \quad (3)$$

The most widely used metric to evaluate these models is their ability to detect EM. Dechow *et al.* (1995) find that the modified Jones model exhibits the most power in detecting EM. The modified Jones model has also many variants. One of the popular variant is to estimate abnormal accruals using firm-specific (i.e. time-series) regressions and industry-specific (i.e. cross-sectional) regressions. The firm-specific estimation procedure involves estimating total (referred as normal) accruals using observations for the same firm over time, while the industry-specific estimation procedure involves estimating TA using observations of all firms within an industry at a point of time. Some researchers suggest that the firm-specific method is more appropriate (Dechow and Dichev, 2002; DeFond and Park, 2001), while others suggest that the industry-specific method is more appropriate (Bartov *et al.*, 2001; Kothari *et al.*, 2005). The main argument for industry-specific regression is in the context of sample being small and survival bias (Kothari *et al.*, 2005). In our estimation, we opted for firm-specific regression coefficients in Equation (2) as we had adequate time series for each firm. Kothari *et al.* (2005) also compute DA as residuals from the TA equation, but we opted not to use this approach as it is based on the assumption that a group of firms has a stable accrual-generating process over time. By opting for firm-specific method, we preserve heterogeneity of the accrual-generating process of firms and thereby minimize the "measurement error" in the estimation of abnormal accruals.

Kothari *et al.* (2005) argue for the inclusion of ROA for controlling for earnings performance. The main difference between these two approaches is that the modified Jones model (1995) uses firm-specific regressions, while Kothari *et al.* (2005) use industry-specific regressions. We estimate both modified Jones with firm-specific coefficients (1995) and ROA version models and find that empirical results with regard to mispricing of DA in India are invariant to the discretionary accrual models deployed, and hence we report the results based on the modified Jones model using firm-specific coefficients (Dechow *et al.*, 1995).

The study uses the widely used Mishkin (1983) test to whether prospective equity market prices reflect accruals in India. Mishkin (1983) test is used in macro-econometrics testing for market efficiency. This is based on the following two systems of equations. Sloan (1996) uses the accrual and cash flow components to estimate the expectation of earnings (Net Income) in the next period (forecasting equation). Following Xie (2001), we use TA and operating cash flow (OCF) to estimate Net Income in the next period:

$$Net\ Income_{t+1} = \gamma_0 + \gamma_1 TA_t + \gamma_2 OCF_t + \varepsilon_{t+1}. \quad (4)$$

Then, it is combined with the persistence model with the rational pricing model to estimate returns from year $t+1$ (Equation (5)). This implies that a return from $t+1$ is responding to

the unexpected earnings in year $t+1$. β_1 represents the valuation coefficient and the unexpected earnings is in the parenthesis of the following equation:

$$ABNORMAL\ RETURNS_{t+1} = \beta_0 + \beta_1\left(Net\ Income_{t+1} - \gamma_0 - \gamma_1 TA_t - \gamma_2 OCF_t\right) + \Delta_{t+1}, \quad (5)$$

where γ_0, γ_1 and γ_2 represent the estimate of persistence implicit in stock returns. In efficient markets, investors should identify correctly the difference in persistence of the earnings components, and the coefficients across the equations should be similar.

We also estimate similar equations for DA model as well:

$$Net\ Income_{t+1} = \gamma_0 + \gamma_1 DA_t + \gamma_2 OCF_t + \varepsilon_{t+1}, \quad (6)$$

$$ABNORMAL\ RETURNS_{t+1} = \beta_0 + \beta_1\left(Net\ Income_{t+1} - \gamma_0 - \gamma_1 DA_t - \gamma_2 OCF_t\right) + \Delta_{t+1}. \quad (7)$$

The calculation of abnormal returns follows Sloan (1996). The return of each individual firm is scaled by the size where the excess returns of individual assets over a control portfolio (BSE Sensex portfolio). The size variable used in the adjustment is the firm's market capitalization value. The distribution of the individual returns is divided into quartiles by size (market capitalization value), and the abnormal return of individual assets is reduced from returns of control portfolio of equivalent sizes.

There is criticism of the Mishkin's test, especially its economic significance (Sloan, 1996; Clinch *et al.*, 2012). In order to overcome such criticism, we also perform the hedge portfolio test while investigating the presence of accrual anomaly. To perform a hedge portfolio test, firms are ranked based on the size of TA and DA and classified into five quintiles: quintile 1 has the lowest accrual component while quintile 5 has the highest accrual component. The list of variables used in the study is provided in Table AI.

4. Empirical results

This section presents the results of our empirical study with respect to India. Table I reports the descriptive statistics of estimates of DA in the Indian corporate sector during 2003–2011. The average DA is estimated at 1 percent of the average total assets of Indian

	Total accruals (TA)	Discretionary accruals (DA)	Net Income	Total assets (SIZE)	CFO	ABNORMAL RETURNS
Mean	0.0522	0.0092	26.63	276.33	23.08	0.59
Median	−0.0070	−0.0028	1.53	25.30	0.93	−0.12
Maximum	406.0000	14.2640	5,001.70	68,989.10	7,479.10	383.54
Minimum	−12.9559	−13.3368	−1,048.50	0.01	−4,210.0	−1.43
SD	4.0277	0.4823	160.12	1,717.45	179.83	5.20
Skewness	100.2614	−3.0087	15.079	20.59	15.77	43.72
Kurtosis	10,105.68	208.5688	318.78	585.19	524.07	2,936.70
Observations (n)		10,215	10,215	10,215	10,215	10,215

Notes: The variable SIZE is total assets (in $m). EBIT is earnings before interest and taxes (in $m). CFO is cash flows from operations (in $m). ABNORMAL RETURNS are computed as difference between actual returns and returns in market (BSE Index). This table presents the variables for the analysis of measuring earnings management through discretionary accruals (calculated by the Modified Jones Model) of 1,135 publicly listed Indian companies from 2003 to 2011

Table I.
Descriptive statistics

companies[8] (of around $256m) during 2003–2011. The magnitude of DA in the Indian context during 2003–2011 varies substantially as evident from the minimum and maximum values. The average size of the firm (SIZE) comes to $276m with median size estimated far lower at $25m, which shows that a significant presence of large firms in the sample. The abnormal returns are equal to 0.39, compared with a median return of −0.12, which shows that a large number of high values accounted for substantial portion of the sample. The large variation in abnormal returns can be gauged from the minimum (−1.40) to a maximum of 383.54.

Table II reports the results of correlation matrix of variables used in the empirical exercise. As is evident, the correlation between accruals (total and discretionary) and cash flow from operations are negatively correlated and this is consistent with prior research (Sloan, 1996; Barone and Magilke, 2009). Similarly, the correlation between DA and size is negative but not strong. On the other hand, there is a statistically significant relationship between size and performance and leverage.

Panels A of Tables III and IV report the results of the Mishkin test for the rational pricing of accruals and cash flows (Equations (4) and (5)) for the total sample of 10,215 firm years. As far as earnings' forecast equation of total accrual model is concerned (Equation (4)), only

	TA	DA	Net Income	CFO	SIZE	ABNORMAL RETURNS
TA	–	−0.062***	−0.001	−0.003	−0.001	0.005
DA	0.410***	–	0.000	−0.021**	−0.001	0.041***
Net Income	0.140***	0.008	–	0.770***	0.777***	−0.005
CFO	−0.333***	−0.171***	0.609***	–	0.671***	−0.004
SIZE	0.073***	0.015	0.733***	0.528***	–	−0.003
ABNORMAL RETURNS	0.060***	−0.129***	0.143***	0.105***	0.052***	–

Notes: The variable SIZE is total assets (in $m). Net Income is calculated by taking revenues and adjusting for the cost of doing business, interest, taxes and other expenses. CFO is cash flows from operations. Return is computed as $(P_1-P_0)/P_0$. This table presents Pearson correlations (above diagonal) and Spearman correlations (below diagonal) of the variables used in the empirical investigation. *,**,***Statistically significant at 10, 5 and 1 percent, respectively (two-sided test)

Table II. Correlation matrix of variables in Indian non-financial corporate sector: 2003–2011

Parameter	Estimate	*t*-statistics	*p*-value
Panel A: full sample – profit and loss firms (10,215 observations)			
γ_1	−0.004	0.0167	0.987
γ_2	0.680	114.133	0.000
β_1	−0.0001	−0.177	0.860
Panel B: loss firms (1,640 observations)			
γ_1	5.160	1.789	0.074
γ_2	−0.137	−13.743	0.000
β_1	0.000	0.370	0.714
Panel C: profit firms (8,575 observations)			
γ_1	−0.005	−0.019	0.985
γ_2	0.714	114.218	0.0000
β_1	−0.000	−0.483	0.629

Note: $Net\ Income_{t+1} = \gamma_0+\gamma_1 TA_t+\gamma_2 OCF_t+\varepsilon_{t+1}$
$ABNORMAL\ RETURNS_{t+1} = \beta_0+\beta_1\left(Net\ Income_{t+1}-\gamma_0-\gamma_1 TA_t-\gamma_2 OCF_t\right)+v_{t+1}$

Table III. Mishkin tests for the rational pricing of total accruals and cash flows – 2003–2011

Parameter	Estimate	*t*-statistics	*p*-value
Panel A: full sample – profit and loss firms (10,215 observations)			
γ_1	2.513	1.014	0.311
γ_2	0.770	97.337	0.000
β_1	0.00	0.195	0.846
Panel B: loss firms (1,640 observations)			
γ_1	1.177	1.031	0.303
γ_2	−0.115	−17.673	0.000
β_1	0.001	0.419	0.675
Panel C: profit firms (8,575 observations)			
γ_1	4.973	1.965	0.049
γ_2	0.765	111.134	0.000
β_1	−0.0001	−0.260	0.797

Note: $Net\ Income_{t+1} = \gamma_0 + \gamma_1 TA_t + \gamma_2 OCF_t + \varepsilon_{t+1}$
$ABNORMAL\ RETURNS_{t+1} = \beta_0 + \beta_1 (Net\ Income_{t+1} - \gamma_0 - \gamma_1 TA_t - \gamma_2 OCF_t) + v_{t+1}$

Table IV.
Mishkin tests for the rational pricing of discretionary accruals and cash flows – 2003–2011

OCF (γ_2) coefficient (0.680) is statistically significant (panel A of Table III). The coefficient associated with TA is negative (−0.004) and not statistically significant. The possibility of $\gamma_1 = \gamma_2$ is also rejected.

For the DA model (panel A of Table IV) for the total sample, again the OCF coefficient (0.770) is statistically significant. The coefficient association with DA is high (2.513) but not statistically significant (panel A of Table IV). Similar analysis was done separately for loss firms (1,640 firm years) (panels B of Tables III and IV) and profit firms (8,575 firm years), which also shows that γ_2 is statistically significant; γ_2 is negative for loss-making firms (panels C of Tables III and IV).

Now we turn to the impact of earnings forecast equation on stock returns in subsequent returns. The estimate for valuation coefficient (β_1) represents that the estimated persistence based on earnings forecast model is zero for the total sample in both total accrual and discretionary accrual models (Panels A of Tables III and IV). Moreover, this coefficient is statistically insignificant, implying that Indian stock market underprices the cash flow component of earnings invalidating *H2*. For profit- and loss-making firms, separately (panels B and C of Tables III and IV), the results are the same, invalidating *H2*.

Tables V and VI report results of Mishkin test based on five portfolio's based on total and DA, respectively, from the lowest to the highest. For the TA model of forecasting equation (Equation (4)), none of the independent variables (TA and OCF) is statistically significant in the entire five portfolio's (Table V). Similarly, for the valuation equation (Equation (5)), the slope coefficient (β_1) is almost equal to zero and statistically insignificant in the entire five portfolio's. Similar results are evident for discretionary accrual models (Equations (6) and (7) and Table VI).

The results are not surprising, given the nature of the Indian equity market. The Indian equity market is dominated by retail investors which account for 47–60 percent of cash market turnover in BSE and NSE in India (Table AII). The share of institutional investors (investment funds, pension funds, insurance companies, foreign institutional investors) varied between 11 and 30 percent. The extant literature points out that equity markets dominated by institutional investors are intensively monitored by institutions (Fich *et al.*, 2015). Similarly, the trading of considerable shares was infrequent; shares trading above 100 days (a low metric) as a proportion of total traded varied between 67 and 95 percent (Table AII).

Parameter	Estimate	*t*-statistics	*p*-value
Portfolio I			
γ_1	−0.061	−0.143	0.886
γ_2	0.009	0.473	0.636
γ_1	0.000	−0.068	0.947
Portfolio II			
γ_1	54.404	1.596	0.111
γ_2	0.004	0.206	0.837
β_1	−0.0005	−0.345	0.730
Portfolio III			
γ_1	−8.226	−0.286	0.775
γ_2	−0.002	−0.134	0.894
β_1	0.000	−0.118	0.906
Portfolio IV			
γ_1	−11.741	−0.370	0.711
γ_2	0.003	0.160	0.873
β_1	−0.0002	0.258	0.796
Portfolio V			
γ_1	−10.059	−1.031	0.303
γ_2	−0.001	−0.022	0.982
β_1	−0.0002	−0.448	0.654

Note: This table presents results of Mishkin tests based on five portfolios formed based on total accruals – from the lowest to the highest

$Net\ Income_{t+1} = \gamma_0 + \gamma_1 TA_t + \gamma_2 OCF_t + \varepsilon_{t+1}$

$ABNORMAL\ RETURNS_{t+1} = \beta_0 + \beta_1 (Net\ Income_{t+1} - \gamma_0 - \gamma_1 TA_t - \gamma_2 OCF_t) + v_{t+1}$

Table V.
Mishkin tests for the rational pricing of total accruals and cash flows by portfolio – 2003–2011

5. Concluding observations

One of the hotly debated topics in the area of finance is whether accruals and cash flows components of earnings are reflected in the prospective stock prices. The overwhelming evidence in this area with regard to developed stock market is that market overestimates the persistence of accruals and underestimates the cash flows which lead to firms having high accruals earning negative abnormal returns in future periods (accrual anomaly). There are also contrary results with respect to other countries. Given the conflicting evidence, we examine whether anomaly exists in an emerging market like India which is dominated by retail investors. The empirical study of accruals of 1,135 listed Indian companies (non-financial) during 2003–2011 shows that the estimated average DA of non-financial corporate sector in India is 1 percent of the total assets of these firms. The study also shows that EM has shown an increase of 0.92 percent during 2003–2011.

An empirical analysis to test whether equity market prices accruals in India finds no evidence of semi-strong market efficiency. These results are in conformity with the majority of international evidence, especially the pioneering study by Sloan (1996). Empirical evidence also finds that the results are invariant for profit- and loss-making firms in the Indian context, which is at variance with the results of the study of China by Li *et al.* (2011), where empirical evidence shows that if one eliminates loss-making firms from the sample, there is no mispricing. Subsequent empirical analysis based on hedge portfolio's (from lowest to highest accruals) also validate these results. The empirical evidence provides evidence that the Indian stock market is inefficient with regard to the incorporation of accruals in pricing of stocks in subsequent periods. The results are not surprising, given the fact that the Indian equity market is dominated by retail investors who are basically noise

Parameter	Estimate	*t*-statistics	*p*-value
Portfolio I			
γ_1	4.644	0.812	0.417
γ_2	0.009	0.468	0.640
β_1	0.000	−0.037	0.970
Portfolio II			
γ_1	6.829	0.077	0.939
γ_2	0.004	0.193	0.847
β_1	−0.000	−0.313	0.754
Portfolio III			
γ_1	−200.369	−2.127	0.034
γ_2	−0.003	−0.193	0.847
β_1	0.000	−0.027	0.978
Portfolio IV			
γ_1	−84.403	−1.088	0.277
γ_2	0.003	0.130	0.897
β_1	−0.0002	−0.285	0.776
Portfolio V			
γ_1	−14.724	−1.461	0.144
γ_2	−0.001	−0.026	0.980
β_1	−0.0002	−0.405	0.686

Note: This table presents results of Mishkin tests based on five portfolios formed based on discretionary accruals – from the lowest to the highest

$Net\ Income_{t+1} = \gamma_0 + \gamma_1 DA_t + \gamma_2 OCF_t + \varepsilon_{t+1}$

$ABNORMAL\ RETURNS_{t+1} = \beta_0 + \beta_1 (Net\ Income_{t+1} - \gamma_0 - \gamma_1 DA_t - \gamma_2 OCF_t) + v_{t+1}$

Table VI. Mishkin tests for the rational pricing of discretionary accruals and cash flows by portfolio – 2003–2011

traders and suffer from cognitive limitations in processing sophisticated information. Most investors in India focus on earnings (revenue and earnings per share) when judging the profitability of firms. The information contained in accruals goes unnoticed and the market may be inefficient in processing such information.

Notes

1. The term "accruals" corresponds to the earnings component that does not generate cash flows. Discretionary accruals are the portion of accruals over which management exercises discretion, and this estimated portion of accruals is often used as a proxy of the earnings that is managed.
2. Most of the current research is on earnings management focuses on detecting abnormal accruals. Managers also have the incentives to manipulate real activities to meet earning targets (such as providing discounts to temporarily increase sales, overproducing to report lower cost of goods sold, and reducing discretionary expenses like R&D, advertising expenditures, sales of profitable assets, etc.). See Graham *et al.* (2005), Roychowdhury (2006) and Zhang (2012) for a discussion on real earnings management.
3. See Economist, June 7-13, 2014, p. 81.
4. Indian stock market is one of the most important and unique stock market among emerging markets. It is unique in terms of ownership structure (substantial family ownership), investor participation (retail investor's account for 97 percent of total investors in Indian mutual funds) and long institutional reform process to enhance market efficiency (Dash and Mahakud, 2013, 2015; International Monetary Fund, 2013). The number of listed companies in the Bombay Stock Exchange (BSE) has risen from 4,344 in 1985 to 5,067 in 2012. The market capitalization of these companies was around 89 percent of India's GDP in 2012 (Securities Exchange Board of India, 2012).

5. www.capitaliq.com/home.aspx
6. One recent study (Rudra and Bhattachararjee, 2012) was based on 67 firms listed in BSE.
7. For a review of model features of various discretionary accrual models, see Dechow *et al.* (1995, 2010), McNichols (2000), Kothari *et al.* (2005), Cheng *et al.* (2012) and Zarowin (2015).
8. This is comparable to an earlier estimate of 2.9 percent for a larger cohort of Indian non-financial firms (2,229 firms) for recent period (2009–2011). See Dayanandan *et al.* (2014).

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Appendix 1

Table AI. List of variables and description

Variable name	Description
REV	Revenues (sales) ($m)
REC	Account receivables ($m)
PPE	Gross level of property, plant and equipment ($m)
Net Income	Revenues and adjusting for the cost of doing business, depreciation, interest, taxes and other expenses
CFO	Cash flow from operations ($m)
SIZE	Total assets ($m)
ABNORMAL RETURNS	Size adjusted excess returns of individual assets over a control portfolio (BSE Sensex index portfolio)

Appendix 2

	Bombay Stock Exchange	National Stock Exchange
Panel A: percentage of firms trading more than 100 days		
2009–2010	88.6	92.9
2010–2011	85.4	93.7
2011–2012	81.3	94.0
2012–2013	78.0	95.4
2013–2014	66.8	89.1
2014–2015	70.2	92.5
Panel B: share of retail investors in cash market turnover (%)[a]		
2009–2010	67.0	53.5
2010–2011	68.5	52.0
2011–2012	66.2	47.7
2012–2013	49.8	62.1
2013–2014	59.4	44.9
2014–2015	55.1	49.1
Panel C: share of institutional investors in cash market turnover (%)		
2009–2010	10.1	20.1
2010–2011	11.1	25.4
2011–2012	11.1	25.4
2012–2013	13.1	28.5
2013–2014	14.1	30.0
2014–2015	24.7	29.3

Note: [a]Includes individuals, partnership firms, Hindu Undivided families, public and private firms/corporate/society, statutory bodies, non-resident Indians, overseas corporate bodies, etc.
Source: Securities and Exchange Board of India, Annual Report (Various Issues)

Table AII.
Equity market in India – trading details and share of institutional and retail investors: 2010–2015

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