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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Role of earnings management and capital structure in signalling early stage of financial distress: a firm life cycle perspective

Prof. Palka Chhillar[1]* and Prof. Ramana V Lellapalli[2]

Abstract: Globally, the unravelling of the corporate scandals leading to big multi-national firms stumbling down to bankruptcy suits caused enormous loss of wealth to the investors. This study explores how the earnings management and capital structure can signal an early stage of the distressed financial condition of firms during the firm life cycle in Indian listed companies. The sample firms for the study are the non-financial firms listed on the Bombay Stock Exchange. The study uses fixed-effects and random-effects analyses. The findings of the study indicate that discretionary accruals quality can predict the early stage of financial distress in the decline stage of firm life cycle. Understanding the information embedded in the discretionary accruals and leverage during various life cycle stages can lead to better investing, financing, operating and policy-related decisions. This study provides novel insights into the relationship between earnings management and firm life cycle. Focusing on the inter-relationship between financial distress signalling, earnings management, capital structure and firm life cycle, this work adds significantly to the finance literature.

Subjects: Corporate Finance; Financial Accounting; Financial Statement Analysis

Keywords: accruals quality; capital structure; debt financing; earnings management; firm life cycle; financial distress

1. Introduction

The accounting scandals leading to bankruptcy filings by multinational enterprises across globe have resulted in huge loss of investors' wealth. The dysfunctional corporate governance, lack of managerial accountability and managerial opportunistic behaviour led to misrepresentation of the financial statements (Chang & Sun, 2010; Fan et al., 2021). The manipulation of reported numbers by the agents had been achieved through a plethora of routes. The allegations in the corporate failures ranged from inflating revenues, overstating profits, capital expenditure, channel stuffing, improper revenue recognition and to inappropriate usage of off-balance sheet items. The increased accounting scandals in the post Enron era and resulting loss to the ordinary investors have jolted the regulators, policymakers, practitioners, as well as academic researchers. Consequently, the researchers are motivated to study the effect of manipulating the financial numbers on the financial health of the firms. While understanding the precursors of the accounting frauds, the "earnings management" practices adopted by the managers raise a host of questions on the legitimacy of the reported numbers.

In the Indian context, the Satyam case in 2009, which is considered to be perhaps the biggest corporate fraud in the national scenario, reported a loss of USD 2,000 million to the investors,

again shaking the Indian regulators and lawmakers. Many cross-country studies on the earnings opacity and earnings management rank India at top in overall opacity (Bhattacharya et al., 2003; Shahzad, 2016). In India, earnings management as measured by discretionary accruals amounts to 2.9% of the total assets as compared to 1% in the US (Ajit et al., 2013) Earnings management activities have also been reported to vary with firm size, with small firms reporting 10.6% of total assets, medium firms at 0.4% and large firms at 0.3%. Firm size in turn is considered to be a function of firm life cycle as the small and large firms are considered to differ on age, size and the information availability (Berger & Udell, 1998). The availability of sources of finance and dividend payouts varies with the financial growth life cycle varying from angel financing to raising the public equity Bhattacharya et al. (2019). The sources of finance or the capital structure of firm dictates the ways of monitoring by the stakeholders and demand for information pertaining to the financial health of the firm. The information quality of the reported numbers reflects the distressed financial health of the firm (DeAngelo et al., 1994; Li et al., 2020). The managers are tempted to resort to manipulation of earnings due to many objectives such as concealing the weak performance and debt covenant violations (DeFond & Jiambalvo, 1994).

With this context, the present study seeks to investigate how the firm's earnings management practices are affected by the firm life cycle. Secondly, the research focuses on answering how do earnings management practices along with debt financing play a role in signalling the early stage of financial distress over the firm life cycle.

The study proceeds on the following categorization: Section 2 presents the conceptual framework, literature review of the causal linkages followed by the research gap and theoretical model. Section 3 discusses the research design, measurements of the constructs and the empirical models. Section 4 presents results of the data analysis. Section 5 includes the discussion of results and findings. Section 6 concludes the study with implications and contribution followed by acknowledging limitations of the study and directions for future research.

2. Literature review and hypotheses development

2.1. Conceptual framework and construct definitions

2.1.1. Firm life cycle
The corporate life cycle connotes the phenomenon of incorporation of a firm; its growth, progress to maturity and decline. The distinct phases of firm life cycle are function of various internal and external factors, which in turn are resultant of firm-level choices and activities (Dickinson, 2011). The availability of sources of finance, capital structure, investment opportunities, accounting policies and even the objectives of existence of the firm evolves over the firms' life cycle. The firms' characteristics over the five life stages, namely, introduction, growth, maturity, revival and decline, were found to be internally consistent, mutually distinct and complementary (Miller & Friesen, 1984). However, the sample firms reported exceptions in reporting a deterministic sequence, thus emphasizing the availability of alternate paths to the corporations while progressing in the life cycle.

2.1.2. Financial distress
Financial distress as a phenomenon has been a focal point of study in corporate finance since the notable corporate failure of Penn Central and railroad industry in 1970 (Altman, 1971; Altman & Nammacher, 1985). Platt and Platt (2002) emphasized that financial distress is the late stage of firm decline, which can be followed by major events such as bankruptcy, liquidation or insolvency. Developing a theory of financial distress, Gordon (1971) suggested that the decrease in the earnings capacity of the firm could result in the possibility of inability of the firm to repay the principal or interest component of debt. Such a state represents the distressed financial condition of the firm. Wruck (1990) also explained "financial distress as a situation, where cash flows are insufficient to cover the current obligations".

2.1.3. Earnings management

The informational quality of the financial statements is a function of the decision context. Dechow et al. (2010) emphasize that the earnings quality is determined by its relevance to the particular decision context and informativeness about the financial performance of the firm. Earnings reported by the firm are a function of both, the fundamental financial performance of the firm as well as the measurement of the performance by the accounting systems established in the firm. The reported earnings are a function of how the accounting measurement systems are implemented in the organizations which involves scope for personal judgements of the managers and accountants, resulting in biases in the reported earnings in the form of earnings management. The constructs "*earnings quality*" and "*earnings management*" are related to each other such that higher earnings management leads to poorer earnings quality. Healy and Wahlen (1999) state that "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers". In a way earnings management enables the management to use the flexibilities provided by the regulatory framework to aesthetically manipulate the financial statements to make them appear as the management wants it to look to the outsiders including the shareholders and stakeholders.

2.1.4. Capital structure

The research (Grossman & Hart, 1982) emphasizes on the role of debt in signalling the quality of management by decreasing the incentive problems using possibility of bankruptcy as a disciplinary tool. The effectiveness of bankruptcy as a disciplinary device in the agency relations is dependent upon the level of debt in the capital structure. Hence, debt acts as monitoring and disciplinary tool, resulting in a demand for higher quality of accounting information and signals the financial health of the firm.

2.1.5. Theoretical framework

Agency theory (Eisenhardt, 1989; Jensen & Meckling, 1976) provides us the fundamental basis to study earnings management and related phenomenon in the light of the principal–agent relationship. Agency theory emphasizes that in a firm managers have superior information pertaining to firm value than the shareholders. Separation of ownership and control in the firm affects the earnings informativeness and magnitude of discretionary accruals adjustment (Warfield et al., 1995). Agency theory links the earnings management with three key aspects: costly contracting, efficient contracting and the information asymmetries (Walker, 2013). To a large extent these approaches successfully justify the motives behind managing the reported numbers. The costly contracting approach refers to the assumption in the agency theory that firm is a nexus of contracts, and the contracts are difficult to negotiate. Hence, managers indulge in manipulation of earnings to avoid the violations of contractual obligations (debt covenants and compensation contracts). Thus, the costly contracting approach provides the basis to understand the relationship between the financial distress and earnings management.

In the context of relationship between earnings management and firm life cycle, the life cycle theory emphasizes on the intentions of a manger to pursue growth rather than shareholder value maximization as a corporation matures (Mueller, 1972). The behaviour of the agent can be justified as their monetary and non-monetary benefits are directly or indirectly attached to the firm's growth. In the initial stages of the entrepreneurial venture, both the managers and the stockholders aim for growth maximization strategies. As the organization grows and matures, the conflict of the managerial utility maximization and stockholder wealth maximization deepens. In the mature firms, declining profits and decreasing investment opportunities result in ploughing back of profits at lower than market returns (Grabowski & Mueller, 1975). Thus, the gradual shift in the policies of the managers of firms because of transition from growth stage to mature phase leads to over investment in growth while the stockholders prefer dividend payouts which provides the managers an incentive to manage the numbers.

An agency theory perspective of the firm life cycle suggests how the agents affect the firm's life cycle (Bulmash, 1986). The availability of sources of finance and capital structure varies with the financial growth life cycle of the firm with special reference to the small businesses and entrepreneurial ventures (Berger & Udell, 1998). The present study also explores the effect of capital structure on the earnings management and financial distress, which makes it important to study the underlying theories of capital structure. Myers (2001) reviewed the various capital structure theories in the corporate finance literature. The review emphasized that there are no universal theories of capital structure; however, all the theories can be called as conditional theories, suggesting the costs and benefits of different sources of finance. Modigliani and Miller (1958) suggested that capital structure does not affect the value of the firm, cost of capital and the availability of the capital. However, the capital structure can be affected by tax (trade-off theory), information (pecking order theory) and the agency cost (free cash flow theory; Myers, 2001). The extant literature documents the various determinants of capital structure such as collateral value of assets/assets structure; financial distress; non-debt tax shields; age; growth; uniqueness; signalling; industry classification; size; volatility and profitability (Titman & Wessels, 1988).

Hence, this theoretical foundation provides us with a strong motive to explore the relationship between the variables under study.

2.2. Literature review of causal linkages

2.2.1. Firm life cycle and earnings management
Corporate life cycle is a principal determinant of the value of the summary measures of performance such as earnings and cash flows reported by the firm. However, the relative value relevance of cash flows (operating, investing and financing) to earnings varies with the corporate life cycle (Black, 1998). Earnings are more value relevant than the cash flows at the maturity stage. Further, research (Jenkins et al., 2004) studied the relative value relevance of disaggregated components of earnings on the corporate life cycle. Sales growth is more value relevant during the growth phase of the firm as compared to profitability. The relevance value of profitability is found to be higher in the mature stage of firm life cycle. The search for appropriate measure of firm performance, namely, reported earnings or realized cash flows, has been a subject matter of research in this domain.

Guay et al. (1996) explored the variability and correlation between the various earnings components and suggested that accruals are affected by the firms' stage in the life cycle. Financial statement informativeness about the firm's cash flow generating ability differs during the firm's life cycle hence the earnings response coefficient also varies with the firm life cycle (Kothari, 2001). Thus, the research suggests that accruals differ with changes in firm life cycle. Can and Ntim (2020) studied the effect of corporate life cycle on financial reporting quality and reported that discretionary accruals decrease as the firm moves forward in their life cycle. In the growth phase the pattern of accruals is distinct from the mature or decline phase (Khuong & Anh, 2022; Krishnan et al., 2021; Lucia Michalkova, 2021). Specifically, McNichols (2000) examined the relationship between earnings management as proxied by discretionary accruals and the growth of the firm as measured by earnings growth. The findings from the study indicated that growing firms are expected to have higher discretionary accruals than the lower growth firms, hence suggesting higher earnings management by the higher growth firms. A comparative study (Madhogarhia et al., 2009) between the earnings management practices between value firms and growth firms indicates that the growth firms indulge more aggressively in both positive and negative earnings management as compared to the value firms. Intuitively, firms in the growth phase face higher need of the investment in the inventories and production process, resulting in higher working capital accruals. Apart from the perspective of increased investment in the working capital in the growth phase, the higher information asymmetries in this phase also advocate the presence of higher amount of earnings management in order to meet the earnings targets. These arguments lead to the formulation of the following hypothesis:

H1(a) *Earnings management as measured by discretionary accruals quality in growing firms is positive and higher than mature firms.*

In case of declining firms, these firms decline on two fundamental accounts: financial and human resources. The decline in the financial resources is connected to declining profitability, cash reserves and borrowing capacity (D'aveni, 1989). The author also suggested that the timing of consequences of decline also varies among firms. Hence, firms might not exhibit the characteristics pertaining to organizational decline just before the bankruptcy; rather they might linger in the post-decline phase for several years. The study by DeFond and Jiambalvo (1994) suggests that managers indulge in manipulating the earnings via total accruals and working capital accruals in a year prior to the covenant violation as well as in the year of violation. The results (with both time series (Jones, 1991) and cross-sectional models) concluded that the firms indulge in income increasing (positive) accruals in the year prior to the covenant violation. However, the accruals were reported significantly positive in the year of violation after controlling for the management change and the auditors' going concern qualification. On the contrary, the firms facing more permanent financial distress and expecting the debt contract renegotiation after denial of the waivers are more likely to indulge in income-decreasing earnings management so as to negotiate better terms of debt (Jaggi & Lee, 2002). Lucia Michalkova (2021) suggested that the mature companies indulge in more downward earnings management while the start-ups are more likely to manage the earnings upward. Thus, we formulate the next hypothesis:

H1(b) *Earnings management as measured by discretionary accruals quality is higher and negative (income decreasing) in declining firms than mature firms.*

2.2.2. Capital structure and financial distress

Research on the effect of capital structure on financial distress indicates that presence of debt playing a significant role in ascertaining the financial health of the firm. Ohlson (1980), in research-predicting bankruptcy, suggested that financial structure, along with the firm size, measures of performance and measures of liquidity, affects the probability of failure of the firms. The research (Opler & Titman, 1994) testing the empirical relationship between the firm performance, leverage and distressed industrial environment indicated that a firm with high leverage suffers a higher decline in the sales at the time of industry-wide downturn (distressed industry). Capital structure of the firm also impacts the creditors' perspective in terms of decisions for granting waivers. The empirical findings suggest that firms with higher probability of bankruptcy and higher leverage are less likely to get the waivers. In terms of debt structures, smaller and secured debt increases the probability of getting waivers (Chen & Wei, 1993). Among the fundamental theories of capital structure, trade-off theory posits that firms maintain debt levels after considering the benefits (tax-shield) and costs (possibility of financial distress) of leverage (Alzoubi, 2018). Hence, higher the proportion of debt in the capital structure greater is the possibility of financial distress. The capital structure varies with the firm size as the informational asymmetry is lower in the larger firms, hence have lower debt, making size as an inverse proxy for probability of default. The effectiveness of bankruptcy as a disciplinary device in the agency relations is dependent upon the presence of debt in the capital structure. Debt acts as a signal for quality of firms' management, hence increasing the firm value, which in turn increases the agent's perquisites (Grossman & Hart, 1982). Thus, we formulate the following hypotheses:

H2(a) *The financial distress is positively related to the proportion of debt in growing firms.*

H2(b) *The financial distress is positively related to the proportion of debt in the declining firms.*

2.2.3. Earnings management and financial distress

Prior research on the linkage between earnings management and financial distress indicates that the managers' decisions pertaining to the income-decreasing or -increasing activities are a function of the financial health of the firm. Research by DeAngelo et al. (1994) focuses on analysing the accounting choices of the managers of firms facing persistent financial troubles, namely, dividend reduction and persistent earnings losses. The firms reported high negative accruals after the dividend reduction, which is significantly contributed by inventory decline followed by non-cash-write off, etc. The income-decreasing choice of the managers can be explained by increased monitoring by auditors, lenders and also to strengthen the firms' position in the negotiations with union and government agencies. Hence, the managers' choice to manage accruals is primarily motivated by the financial stability of the company. Various other motivations for the managers to manipulate the earnings are concealing weak performance, avoidance of debt covenant violations, reducing probability of future default, effectiveness of internal control, etc. (DeFond & Jiambalvo, 1994; Jaggi & Lee, 2002; Li et al., 2020). The severity of financial distress also impacts the managerial accounting choices in terms of income-increasing and income-decreasing accruals management (Charitou et al., 2007; Ghazali et al., 2015; Jaggi & Lee, 2002). Firms facing temporary financial distress and expecting to receive the waivers on debt covenant violations are more likely to indulge in income-increasing accruals management so as to signal the creditors about the improving financial health of the firm. On the contrary, the firms facing more permanent financial distress and expecting the debt contract renegotiation after denial of the waivers are more likely to indulge in income-decreasing earnings management to negotiate better terms of debt (Jaggi & Lee, 2002; Habib et al., 2013; Saleh & Ahmed, 2005). The study by Habib et al., 2013 suggests that direction of earnings management can be income increasing or income decreasing; however, financially distressed firms engage more into income-decreasing activities as compared to financially healthy firms. The objective of earnings management differs for the two sets of firms, thus resulting in different approaches to earnings management. However, the results of studies on the managerial accounting choices in the distressed firms are mixed, i.e. income increasing, income decreasing and no effects. Hence, we formulate the following hypotheses:

H3(a) *Earnings management as measured by discretionary accruals quality is positive (income increasing) and is positively associated with the level of financial distress in growing firms.*

H3(b) *Earnings management as measured by discretionary accruals quality is negative (income decreasing) and positively associated with the level of financial distress in declining firms.*

3. Data and methodology

3.1. Data, sample selection and methods

The sample firms for the study are the non-financial firms listed on the Bombay Stock Exchange (BSE). Data regarding the financial indicators and firm attributes were obtained from the Prowess database of the Centre for Monitoring Indian Economy (CMIE). From 5,118 firms listed on BSE, the initial sample includes the firms, for which the data on life cycle descriptors (namely, dividend payout, sales growth and age)[1] are available from years 2003–2013 with 5,698 firm-years of data. The sample period chosen as corporate financial distress and earnings management by the managers was found to be more pronounced during and after the economic crisis (Habib et al., 2013). The macroeconomic indicators were found to be a significant predecessor of the firm-level distress (Arampatzi et al., 2015). Hence, the present study focuses on the time period pertaining to the global financial crisis of 2008 and post-global economic crisis. The data requirement for the estimation of constructs under study further restricts the final analysis to include data from the years 2008–2013 with 3,108 firm-year observations.[2] The sample size varies from 2,590 firm-year observations to 3,108 firm-year observations for different empirical models.

The data analysis uses the *transition analysis* of firms to the subsequent life cycle stages over a period of 5 years to throw light on the important aspects of the firm life cycle. The study uses the panel data regression analysis for the two empirical models testing the hypothesized relationships between the variables under study. The results of both the fixed-effects model and random-effect model are reported. The Hausman specification test is used to choose between the fixed-effects model and the random-effects model. Various additional checks have been carried out in the study to explore the phenomenon under consideration using alternate measures for the measurements of the various constructs.

3.2. Measurement of main constructs

3.2.1. Firm life cycle
The study uses both the univariate and multivariate ranking procedures for estimating the firm life cycle as suggested by Anthony and Ramesh (1992). Steps in firm life cycle estimation are

(i) Three life cycle descriptors are selected, namely, dividend payout (DP), sales growth (SG), and Age.[3]

(ii) The value of the three descriptors (DP, SG, and Age) is calculated for each firm and each year.

(iii) For each firm-year, median values of the descriptors (MDP and MSG) are calculated using prior 5-year data.

(iv) All descriptors are grouped into various life stages such as [Low, Medium, High] for MDP, MSG, and [Young, Adult, Old] for age for all the firm-years on the basis of Table 1. Equal number of firms was assigned to each life cycle stage according to the individual life cycle descriptor.

(v) After assigning firm-years into groups, they are assigned score as 1 = growth, 2 = mature, 3 = stagnant. Summation of the scores is done to get a composite score for each firm and each year. The firms are further classified into Growth, Mature and Decline based on the composite scores.

3.2.2. Earnings management
Earnings management is measured by the model proposed by Francis et al. (2005), which is a combination of Dechow & Dichev, 2002 and Modified Jones Model proposed by Dechow et al. (1995). The model measures earnings management by measuring total accruals quality (Equation 1) and then segregates the total accruals quality into non-discretionary and discretionary accruals quality (Equation 5). The model defines the accruals quality as how perfectly the estimated accruals map into the realized cash flow along with changes in revenue and property, plant and equipment (PPE).

Table 1. Classification of firms on the basis of life cycle descriptors			
Life cycle stages	**Life cycle descriptors**		
	Dividend payout	Sales growth	Age
Growth	Low	High	Young
Mature	Medium	Medium	Adult
Stagnant	High	Low	Old

$$TCA_{i,t} = \beta_{0,t} + \beta_{1,t}CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_{3,t}CFO_{i,t+1} + \beta_{4,t}\Delta REV_{i,t} + \beta_{5,t}PPE_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$TCA_{i,t} = \Delta CA_{i,t} + \Delta CL_{i,t} - -\Delta Cash_{i,t} + \Delta STDEBT_{i,t} \quad (2)$$

$$CFO_{i,t} = NIBE_{i,t} - -TA_{i,t} \quad (3)$$

$$TA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta CASH_{i,t} + \Delta STD_{i,t} - DEP_{i,t} \quad (4)$$

where TCA = total current accruals; CFO_{t-1}= previous year's cash flow from operations; CFO_t= present year's cash flow from operations; CFO_{t+1}= next year's cash flow from operations; ΔREV= change in the revenue from the previous year; PPE= gross property, plant and equipment; ΔCA = change in current assets; ΔCL= change in current liabilities; $\Delta CASH$= change in cash and cash equivalents; ΔSTD= change in debt included in current liabilities; NIBE= net income before extraordinary items; TA= total accruals and Dep= depreciation and amortization expenses.

The total accruals quality (AQ) is measured by unexplained portion in the model (Equation 1). The results of the annual cross-sectional regression yield firm-specific and year-specific residuals. The accruals quality is estimated as the standard deviation of residuals computed over 5 years from "t" to "t-4" calculated from Equation (1). The standard deviation of the unexplained portion (residuals) of variation in estimated accruals is an inverse measure of accruals quality. Hence, higher the standard deviation represents lower accruals quality and higher earnings management.

The model further decomposes the accruals quality into innate and discretionary components. It uses five fundamental or innate factors affecting the accruals quality: firm size (log of total assets), standard deviation of cash flow from operations (σCFO), standard deviation of sales revenue (σ sales), length of operating cycle and incidence of loss realization (NegEarn). The estimation in the current study excludes the operating cycle as the data related to operating cycle is not available for a number of firms, so keeping this variable can reduce our sample size further (Jaggi et al., 2009). The estimation of discretionary component of accruals quality uses a 7-year rolling window. Equation (5) is used for the estimation of discretionary component of accruals quality. The discretionary accruals component of the accruals quality (DIS_AQ) is the residual from the equation.

$$AQ_{i,t} = b_{i,0} + b_1 SIZE_{i,t} + b_2 \sigma CFO_{i,t} + b_3 \sigma SALES_{i,t} + b_4 NEGEARN_{i,t} + e_{i,t} \quad (5)$$

where AQ = accruals quality measured using Equation 1; Size = log of TA; σ CFO = standard deviation of the cash flow from operations estimated over a 7-year rolling window; σ Sales = standard deviation of net sales estimated over a 7-year rolling window and NEGEARN = number of instances of loss reported by the firm in the last 7 years.

3.2.3. Capital structure
The study estimates the capital structure using leverage based on book value of debt. The book value has been used as it is considered to reflect the managerial decision-making more directly (Kisgen, 2006). Empirical research also indicates that the correlation between market value and book value of debt is significantly high, which makes these two measures indistinguishable (Bowman, 1980). The leverage based on the book values of debt is more suitable for the present research context as the book value of debt is found to be more representative of the ability of the firm to repay to the debt holders (Bradley et al., 1984). In the study we use the ratio of book value of total (long term and short term) debt to total assets as the proxy for capital structure.

3.2.4. Financial distress

The research uses the financial ratio-based models for distress and bankruptcy prediction. Research suggests that the 1-year prior financial ratios are the best predictors of financial distress (Reisz & Perlich, 2007). Financial ratio-based distress prediction models are better suited for the study as the research focuses on early signs of signalling the financial distress of the firm rather than classifying the firms into bankrupt and non-bankrupt firms.

The seminal and most widely used Altman (1968) model of predicting the bankruptcy was modified by MacKIE-MASON (1990) by excluding one variable from the original model. The excluded variable was Market value of equity/Total debt (X4) as it is systematically related to the other variables, which are generally examined in the financial studies such as leverage ratios (Lee et al., 2011). In conformity to our research objective and the capital structure (debt) as the variable under study, we use the Modified Altman Z-score (MacKIE-MASON, 1990) for estimating the early signs of financial distress of the firms. The model has been widely used in the literature (Acharya et al., 2007; Bhagat & Bolton, 2008; Burak Güner et al., 2008; Graham et al., 1998).

The model is as follows:

$$Z = .012X1 + .014X2 + .033X3 + .999X4 \tag{6}$$

where Z = overall index; Xl = working capital/total assets; X2 = retained earnings/total assets; X3 = earnings before interest and taxes/total assets; X4 = sales/total assets.

The ratios used in the models were found to be considerably higher for the nonbankrupt firms, hence leading to a higher Z-score. The higher the Z-score, the lower is the probability of distress.

3.3. Empirical models

The *relationship between earnings management as measured by discretionary accruals quality and firm life cycle* is estimated using the following equation:

$$DIS\_AQ_{i,t} = \beta_0 + \beta_1 Growth\_Dummy_{i,t} + \beta_2 Decline\_Dummy_{i,t} + \beta_3 FirmSize_{i,t}$$
$$+ \beta_4 FirmPerformace_{i,t} + \in \tag{7}$$

where DIS_AQ, discretionary accruals quality, is estimated after decomposing the accruals quality estimated as the standard deviation of the residuals obtained from Equation (1) using 5-year period from t-4 to t into innate and discretionary components. The model uses two dummy variables for the three life cycle stages, namely, growth, mature and decline. *Growth_Dummy* is the dummy variable, which takes a value 1 for growth firms and zero otherwise. *Decline_Dummy* is the second dummy variable, which takes a value 1 for the firms classified as declining firms and zero otherwise. We control for firm size and firm performance in the model. *Firm size* is the logarithmic transformation of the total assets of the firm. *Firm performance* is return on assets estimated as profit after tax (net of prior period and extraordinary items) as a percentage of total assets.

The *relationship between financial distress, earnings management and capital structure* is estimated using the following equation, with an objective to study the role of discretionary accruals quality and presence of debt in the capital structure in signalling early stage of financial distress.

3.4. Model 1

$$ZScore_{i,t+1} = \beta_0 + \beta_1 DIS\_AQ_{i,t} + \beta_2 Debt_{i,t} + \beta_3 GrowthDummy_{i,t} + \beta_4 DeclineDummy_{i,t} +$$
$$\beta_5 FirmSize_{i,t} + B_6 FirmPerformace_{i,t} + \in \tag{10}$$

3.5. Model 2

$$ZScore_{i,t+1} = \beta_0 + \beta_1 DIS\_AQ_{i,t} \text{ X Growth Dummy} + \beta_2 DIS\_AQ_{i,t} \text{ X Decline dummy} + \beta_3 Debt_{i,t}$$
$$\text{X Growth Dummy} + \beta_4 Debt_{i,t} \text{ X Decline Dummy} + \beta_5 FirmSize_{i,t} + \beta_6 FirmPerformace_{i,t} + \in$$

$$(11)$$

where *Financial Distress* is the Z-score calculated using the Modified Altman Z-score model estimated at time period t + 1 while the independent variables are estimated at time period t. DIS_AQ is estimated after decomposing the accruals quality estimated as the standard deviation of the residuals obtained from Equation (1) using 5-year period from t-4 to t into innate and discretionary components. *Debt* is defined as the ratio of total debt (long term and short term) to total assets. The model uses two dummy variables for the three life cycle stages, namely, growth, mature and decline. *Growth_Dummy* is the dummy variable, which takes a value 1 for growth firms and 0 otherwise. *Decline_Dummy* is the second dummy variable, which takes a value 1 for firms classified as declining firms and 0 otherwise. The model uses four interactions terms for capturing the interaction effect between the two dummy variables, i.e. Growth_Dummy, Decline_Dummy and the two independent variables, i.e. earnings management and debt.

The additional interaction term for capturing the interaction effect between capital structure and firm life cycle has been introduced to test the potential effect of firm life cycle on capital structure. The literature indicates that the availability of sources of finance and capital structure varies with the financial growth life cycle of the firm with special reference to the small businesses and entrepreneurial ventures (Berger & Udell, 1998). Depending on the financial needs, access to the intermediaries and stage in the life cycle, firm's sources of finance varies from angel finance or insider finance on one end of the continuum to public equity on the other end. The major point of difference between large firms and small firms is the informational opacity as the firms' contracts with stakeholders are not publicly available in case of small firms. The study also suggested that the younger firms are more likely to use public equity and long-term debt than the older firms. An agency theory perspective of a firm life cycle suggests how the agents affect the firm's life cycle (Bulmash, 1986). The dynamic agency model over a multi-period horizon indicates that the agent's incentive structure affects the operating decisions taken by him over the firm's life. Hence the agent's behaviour, decisions and perceptions are affected the firm life cycle indirectly.

We control for the capital structure, firm size and firm performance in the model. *Firm Size* is the logarithmic transformation of the total assets of the firm. *Firm Performance* is return on assets estimated as profit after tax (net of prior period and extraordinary items) as percentage of total assets.

4. Data analysis and empirical results

4.1. Descriptive statistics

Table 2 shows the descriptive statistics of life cycle descriptors, i.e. % change in sales and dividend payout for different life cycle stages. The mean and median sales growth are declining moving from growth firms to the declining firms across most of the years. The firms in the growth phase are considered to have higher growth opportunities for market expansion, hence exhibiting a higher sales growth as compared to mature and declining firms. In general, dividend payouts exhibit an increasing trend during the firm life cycle. The firms in the mature and declining phase are considered to have lesser investment opportunities, hence offering higher dividend payout as compared to the firms in growth phase.

Table 3 represents the *transition analysis* of firms to the subsequent life cycle stages over a period of 5 years from "t + 1" to "t + 5". The percentages in bold (shaded rows) indicate the percentage of firms, which remained in the same initial life cycle stage during the subsequent time periods. For instance, 84.82% of the firms are in the same life cycle stage, i.e. growth phase in the

Table 2. Descriptive statistics of life cycle descriptors by stages in the firm life cycle					
S. no.	**Variables**	**Year**	**Growth**	**Mature**	**Decline**
1	% Change in sales mean (median)	t	**29.12**	18.57	15.66
			21.73	15.00	13.62
		t + 1	19.76	14.44	16.89
			18.61	14.57	12.14
		t + 2	13.99	12.82	11.44
			15.52	10.07	5.71
		t + 3	23.41	17.91	**26.36**
			2.27	18.88	**15.66**
		t + 4	23.54	14.07	10.94
			21.10	14.21	13.30
		t + 5	13.15	6.76	6.09
			13.74	7.57	4.94
2	Dividend payout (%) mean (median)	t	17.12	25.71	50.03
			15.48	24.47	32.52
		t + 1	**25.06**	29.54	39.54
			15.40	24.73	34.16
		t + 2	18.93	78.55	36.41
			14.62	23.24	31.56
		t + 3	19.73	23.59	36.90
			15.25	23.37	33.26
		t + 4	16.32	21.53	31.32
			16.35	24.39	32.92
		t + 5	16.70	28.79	**56.65**
			16.52	21.00	**34.81**

Note: Cells with grey color represent the mean values. White color cells represent median values.

Firm life cycle stage was determined using Anthony and Ramesh's (1992) model. Life cycle descriptors are dividend payout, sales growth and age.

next year while 12.50% and 2.68% firms shifted to the adjoining life cycle stages such as growth/mature and mature stage.

The transition analysis throws light on the few important aspects of the firm life cycle. Firstly, the firms in the growth and stagnant phase are considerably more stable as a higher fraction of firms tend to remain in the same life cycle stage in the subsequent years (84.82% of the firms in the growth phase and 86.54% firms in the stagnant phase). Secondly, the firms in the growth/mature, mature and mature/stagnant phases are more dynamic as these firms exhibit a higher tendency to shift to the adjoining stages in the subsequent periods. For instance, only 66% of the firms remain in growth/mature phase in the next year, i.e. t + 1 time period. The mature phase can be significant for firms, which are willing to make a recovery through new strategies. In a nutshell, firms follow a unique life cycle with growth and stagnant phase as relatively more stable phases as compared to growth/mature, mature/stagnant and mature phase.

Table 4 reports the descriptive statistics of variables used in different empirical models in the study. The variable AQ (accruals quality) in the sample firms shows a mean of 0.033 and a median of 0.027. Francis et al. (2005) reported a mean (median) accruals quality to be 0.0442 and 0.0313. Hence, the sample under study exhibits a lower mean (median) of accruals quality, indicating higher earnings management and lower accruals quality as compared to the sample studied by Francis et al. (2005). The study further decomposes the accruals quality into innate and

S. no.	Initial stage	Stage in future	t + 1	t + 2	t + 3	t + 4	t + 5
Table 3. Transition analysis							
1	**Growth (G)**	**Growth (G)**	**84.82**	**76.79**	**65.18**	**60.71**	**57.14**
		Growth/mature	12.5	17.86	26.79	26.79	24.11
		Mature	2.68	4.46	7.14	8.93	14.29
		Mature/stagnant		0.89	0.89	3.57	3.57
		Stagnant					0.89
2	**Growth/mature**	Growth (G)	9.78	16.3	18.48	19.57	21.74
		Growth/mature	**66.3**	**53.26**	**42.39**	**36.96**	**27.17**
		Mature	20.65	22.83	28.26	32.61	29.35
		Mature/stagnant	3.26	6.52	9.78	8.7	14.13
		Stagnant		1.09	1.09	2.17	7.61
3	**Mature (M)**	Growth (G)	2.75	5.5	6.42	11.01	11.01
		Growth/mature	11.93	18.35	25.69	24.77	28.44
		Mature	**71.56**	**55.96**	**44.95**	**34.86**	**28.44**
		Mature/stagnant	13.76	16.51	17.43	22.02	20.18
		Stagnant		3.67	5.5	7.34	11.93
4	**Mature/stagnant**	Growth (G)	0.99	1.98	1.98	4.95	6.93
		Growth/mature	2.97	5.94	10.89	10.89	11.88
		Mature	17.82	21.78	23.76	24.75	23.76
		Mature/stagnant	**66.34**	**52.48**	**38.61**	**33.66**	**32.67**
		Stagnant	11.88	17.82	24.75	25.74	24.75
5	**Stagnant**	Growth (G)					0.96
		Growth/mature		0.96	0.96		3.85
		Mature	2.88	3.85	8.65	13.46	16.35
		Mature/stagnant	10.58	15.38	18.27	26.92	26.92
		Stagnant	**86.54**	**79.81**	**72.12**	**59.62**	**51.92**

Note: Firm lifecycle was measured using Anthony and Ramesh's (1992) model with dividend payout, sales growth and age as life cycle descriptor.

discretionary component. The mean value of DIS_AQ (discretionary component of accruals quality) is zero with a median of 0.0053, which is close to zero mean and a median value of −0.003 reported by Francis et al. (2005). The authors in the study explain the zero mean values by the estimation of discretionary component of accruals quality as the prediction errors. The negative median values are considered to suggest that for median firm discretionary accruals improve the accruals quality. The mean (median) of the Z-score is 1.021 (0.887), which is considerably lower for the financially healthy firms.

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Table 4. Descriptive statistics					
Variables	**Mean**	**Std. dev.**	**Minimum**	**Median**	**Maximum**
AQ	0.0326	0.0236	0.0022	0.0268	0.267
DIS_AQ	0	0.0233	−0.0549	−0.0053	0.235
Debt	0.2312	0.1863	0	0.2311	0.8019
Z_Score	1.0212	0.74	−0.0365	0.8876	11.0632
Firm Size	3.8247	0.8121	1.281	3.7729	6.4702
Firm Performance	8.2584	7.1744	−43.69	6.82	60.77

Note: AQ = accruals quality measured using Equation (1); DIS_AQ = discretionary component of accruals quality measured using Equation (5); Debt = ratio of total debt to total assets; Z-Score = financial distress score; Firm Size =log of total assets; Firm Performance = return on assets.

4.2. Panel data regression analysis

Table 5 reports the results of panel data analysis to study the effect of firm life cycle on earnings management measured as the discretionary accruals quality with firm size and firm performance being the control variables. The Hausman specification test statistic is statistically significant at the level of 0.01 (Hausman Prob>chi^2 = 0.0000). Hence, the model is estimated using the fixed-effect hypothesis. The data appears to be consistent with the model at the significance level of 0.01 with F (4,2068) = 5.71 and p-value of 0.0001. The coefficient for the dummy variable FLC_DM_3 (dummy variable for the firms in decline stage) is significant and negative (−0.0028) with a t-statistic of −2.34. It supports Hypothesis 1(b) that the declining firms record more negative discretionary accruals than mature firms. However, the coefficient for the dummy variable FLC_DM_1 (dummy variable for the growth firm) for the growing firms is found to be insignificant. Hence, the data of sample firms in our study do not support Hypothesis 1(a). The coefficient of the control variable firm size is positively significant with a coefficient of 0.0085 and a t-statistic of 3.65. The coefficient of firm performance is positively significant with a t-statistic of 2.00. The coefficients for the control variables, firm size and firm performance suggest that earnings management is expected to be higher in the larger firms; however, it is not affected by firm performance.

Table 6 exhibits the panel data analysis results to test the second empirical model establishing the relationship between financial distress, discretionary accruals quality and debt. The Hausman specification test statistic is not statistically significant at the level of 0.05 (Hausman Prob>chi^2 = 0.0514) for model 1. Hence, the model is estimated using the random-effect hypothesis. The data appears to be consistent with the model 1 at the significance level of 0.01 with Wald chi^2 statistic = 83.83 and p-value of 0.0001. The coefficient for variable DIS_AQ is significantly negative (−2.5969) with a z-statistic of −6.2. It suggests a positive relationship between financial distress and discretionary accruals. However, debt coefficient in not significant, indicating the absence of an effect of debt on the financial distress. The coefficient of firm size is significantly negative (−0.1571) with a z-statistic of −5.21. The coefficient for firm performance is significantly positive (0.002) with a z-statistic of 3.06.

Table 6, model 2, introduces interaction terms to study the relationship between financial distress, discretionary accruals quality and debt with a firm life cycle perspective. The variable "DIS_AQ X FLC_DM_1" is the interaction term depicting the discretionary accruals quality of growth firms. "DIS_AQ X FLC_DM_3" is the interaction term depicting the discretionary accruals quality of the firms in decline stage. The variable "Debt X FLC_DM_1" is the interaction term depicting the total debt to assets ratio of the growth firms. "Debt X FLC_DM_2" is the interaction term depicting the total debt to total assets ratio of firms in decline stage. The Hausman specification test statistic is statistically significant at the level of 0.01 (Hausman Prob>chi^2 = 0.0000) for model 2. Hence, the model is estimated using the fixed-effect hypothesis. Model 2 fits the data well at the significance level of 0.01 with F (4,2068) = 9.54 and p-value of 0.0001. The coefficients of variables "Debt

Table 5. Panel data analysis results of discretionary accruals quality and firm life cycle				
Discretionary accruals quality	**Fixed effects**		**Random effects**	
Variables	**Coefficient**	**t-statistic**	**Coefficient**	**z-statistic**
Constant	−0.0322	−3.58	−0.0056	−1.48
	(0.000)*		(0.138)	
FLC_DM_1	−0.0006	−0.49	−0.0008	−0.08
	(0.622)		(0.940)	
FLC_DM_2				
FLC_DM_3	−0.0028	−2.34	−0.0039	−3.68
	(0.020)**		(0.000)	
Firm Size	0.0085	3.65	0.0013	1.35
	(0.000)*		(0.177)	
Firm Performance	0.0001	2.00	0.0003	4.66
	(0.046)**		(0.000)	
***F* (4,2068)/ Wald chi^2**	5.7100		40.0200	
Prob.>F	0.0001		0.0000	
R^2 overall	0.0028		0.0605	
Sigma_u	0.0210		0.1799	
sigma_e	0.0129		0.0129	
Hausman chi^2	66.55			
Hausman prob>chi^2	0.0000			

Note: Accruals are estimated as the standard deviation of the residuals obtained from Equation (1) using 5-year period from t-4 to t. Accruals are further decomposed into innate and discretionary to give the discretionary accruals quality. The model includes two dummy variables for the three life cycle stages, namely, growth, mature and decline. *FLC_DM_1* is the dummy variable, which takes the value 1 for the growth firms and zero otherwise. FLC_DM_3 is the second dummy variable, which takes the value 1 for the firms classified as the declining firms and zero otherwise. *Firm Size* is the logarithmic transformation of the total assets of the firm. *Firm Performance* is return on assets estimated as profit after tax (net of prior period and extraordinary items) as % of assets.

* Significant at the level of 0.1 (*p*-value<0.10); ** significant at the level of 0.05 (*p*-value<0.05); *** significant at the level of 0.01 level (*p*-value<0.01)

X FLC_DM_1" and "Debt X FLC_DM_3" are not statistically significant, hence the results of the data of the firms in the sample do not support Hypotheses 2(a) and 2(b). The coefficient for interaction term "DIS_AQ X FLC_DM_1" is not statistically significant, suggesting an absence of effect of discretionary accruals on financial distress in growth firms. Hence the data of the sample firms do not support Hypothesis 3(a). The coefficient for interaction term "DIS_AQ X FLC_DM_3" is negatively (−3.5313) significant with a t-statistic of −5.67. The negative relationship between Z-score and discretionary accruals quality suggest a positive relationship between financial distress and discretionary accruals. Higher Z-score suggests a lower probability of financial distress. Hence, the results support Hypothesis 3(b).

In a nutshell the analysis of the results of our study point towards the following findings. Firstly, the discretionary component of the accrual quality is more negative in firms in the decline stage than in mature stage. However, the relationship between the firm life cycle and the discretionary accruals quality is not significant for the growth firms. Secondly, financial distress score is not significantly predicted by debt during the firm life cycle. Finally, financial distress can be significantly predicted by the discretionary accruals in decline firm. The result suggests a positive relationship between financial distress and discretionary accruals in the decline stage of firm life cycle.

Table 6. Panel data analysis results of financial distress, discretionary accruals quality and debt

Z_Score	Model 1				Model 2			
	Fixed effects		Random effects		Fixed effects		Random effects	
Variables	Coefficient	t-statistic	Coefficient	z-statistic	Coefficient	t-statistic	Coefficient	z-statistic
Constant	1.5101	8.4000	1.6386	13.3500	1.4254	7.8700	1.6015	13.2100
	(0.000)		(0.000)		(0.000)		(0.0000)	
DIS_AQ	−2.9469	−6.8100	−2.5969***	−6.2000				
	(0.0000)		(0.000)					
Debt	−0.1048	−1.2400	−0.0942	−1.2100				
	(0.216)		(0.228)					
Growth Dummy	0.0102	0.4600	0.0082	0.3800				
	(0.644)		(0.701)					
Mature								
Decline Dummy	−0.0215	−0.9600	−0.0224	−1.0300				
	(0.340)		(0.305)					
DIS_AQ X FLC_DM_1					0.1595	0.2500	0.0103	0.0200
					(0.799)		(0.987)	
DIS_AQ X FLC_DM_3					−3.5313	−5.6700	−2.9617	−4.8500
					(0.000)***		(0.000)	
Debt X FLC_DM_1					0.0796	1.3300	0.0741	1.2900
					(0.183)		(0.198)	
Debt X FLC_DM_3					−0.0628	−0.9900	−0.0618	−1.0000
					(0.322)		(0.319)	
Firm Size	−0.1220	−2.6600	−0.1571	−5.2100	−0.1119	−2.4000	−0.1580	−5.2300
			(0.000)***		(0.016)**		(0.000)	

(Continued)

Table 6. (Continued)

Z_Score	Model 1				Model 2			
	Fixed effects		Random effects		Fixed effects		Random effects	
Variables	Coefficient	t-statistic	Coefficient	z-statistic	Coefficient	t-statistic	Coefficient	z-statistic
Firm Performance	0.0038	2.8900	0.0039 (0.002)***	3.0600	0.0049 (0.000)***	3.7500	0.0047 (0.0000)	3.7400
F (4,2068)/ Wald chi2	11.7000		83.8300		9.5400		70.2400	
Prob.>F	0.0000		0.0000		0.0000		0.0000	
R2	0.0252		0.0324		0.0217		0.0316	
Sigma_u	0.7098		0.6952		0.7110		0.6865	
sigma_e	0.2316		0.2316		0.2324		0.2324	
Hausman chi2	12.51				35.26			
Hausman prob>chi2	0.0514				0.0000			

* Significant at the level of 0.1 (*p*-value<0.10); ** significant at the level of 0.05 (*p*-value<0.05); *** significant at the level of 0.01 level (*p*-value<0.01).

Note: Z_Score measures the financial distress using the Modified Altman Z-score model. Accruals are estimated as the standard deviation of the residuals obtained from *Equation (1)* using 5-year period from t–4 to t. Accruals are further decomposed into innate and discretionary to give the discretionary accruals quality (DIS_AQ). Debt is the ratio of the total debt (long term and short term) to total assets. DIS_AQ X FLC_DM_1 is the interaction term to assess the effect of discretionary accruals in predicting financial distress in growth firms. DIS_AQ X FLC_DM_3 is the interaction term to assess the effect of discretionary accruals in predicting financial distress in declining firms. Debt X FLC_DM_1 is the interaction term to assess the effect of debt on the financial distress prediction in growth firms. Debt X FLC_DM_3 is the interaction term to assess the effect of debt on the financial distress prediction in declining firms. *Firm Size* is the logarithmic transformation of the total assets of the firm. *Firm Performance* is return on assets estimated as profit after tax (net of prior period and extraordinary items) as % of total assets.

* Significant at the level of 0.1 (*p*-value<0.10); ** significant at the level of 0.05 (*p*-value<0.05); *** significant at the level of 0.01 level (*p*-value<0.01).

4.3. Additional analysis

Various additional checks have been carried out in the study in order to explore the phenomenon under consideration using alternate measures for the measurements of the various constructs. The additional analysis uses an alternative measure proposed by Dickinson (2011) for firm life cycle determination and Modified Jones model for estimating the discretionary accruals. The significant results of the additional analysis are reported in this section. The transition analysis of the firms using the Dickinson approach exhibits high dynamism in the movement of firms across life cycle stages. The highly dynamic movement can be attributed to the fact that the firm-level cash flows fluctuate more than the life cycle descriptors (dividend payout, sales growth, age) used in the Anthony and Ramesh (1992) approach. The panel data regression results of the relationship between discretionary accruals measured using Modified Jones model and the firm life cycle stages using the Dickinson (2011) approach. The additional analysis confirms the significantly negative coefficient for firms in the decline stage. It provides additional evidence for Hypothesis 1(b) that the firms in the decline stage have higher negative accruals. However, the model also suggests the significantly positive coefficients for firms in the introduction and growth phases, which supports the hypothesis that firms in the growth phase have higher and positive accruals than the mature firms.

5. Discussion

The global context of corporate scandals and the need to understand the early signs of corporate failure provides the rationale for undertaking the present research. The empirical analysis undertaken in the study presents important insights for understanding the precursors of corporate frauds via earnings manipulation and its impact on the financial health of the firms.The empirical analysis of the sample firms listed on the BSE suggests that firms in the decline stage have significantly higher and negative accruals than mature firms. The objectives of managing the reported numbers in the declining firms are twofold: firstly, to avoid the debt covenant violations, and secondly to receive the better terms in the debt contract renegotiations. The firms in the declining stage manipulate the numbers downwards, engaging into income decreasing activities to negotiate better debt covenants in the debt renegotiation after the debt covenant violations (Can & Ntim, 2020; DeFond & Jiambalvo, 1994; Jaggi & Lee, 2002). The possible explanation for the deviant results lies in the properties of the cash flows, which are used as the basis for determining the life cycle stage in the study. The additional analysis uses the Dickinson's cash flows approach for determining the firm life cycle. Hence, the results of additional analysis find support in this study, emphasizing the significance of methods of measurement of variables for comparison of the results. However, the results are not found to be significant in the case of growth firms, indicating a lack of evidence for the specific pattern of earnings management activities followed by the firms in the growth phase. In the growth phase of the life cycle, survival takes precedence and establishing credibility could be the primary objective of the firm, leading to the non-reliance on managing earnings for negotiating better terms in the contracts. Also, firms in the growth phase are expected to have higher non-discretionary accruals as the firms are in expansion phase, which might not provide the firms with an incentive to manage the earnings via discretionary accruals route. The lack of evidence of earnings management by the discretionary accruals in the growth firms is also supported by the significant and positive coefficients for the firm size. It suggests that the larger firms indulge more into earnings management. Hence, growth firms being in the formation phase are generally smaller in size, thus showing insignificant earnings management activities as compared to the firms in the declining phase.

The accounting choices and the earnings management activities undertaken by the managers also reflect the financial health of the firm. The results of the analysis indicate that the firms in financial distress indulge in higher earnings management through discretionary accruals. The managers of the distressed firms have several motives for manipulating the reported numbers such as concealing weak performance, avoiding debt covenants violations, reducing the probability of future default and receiving better terms of contract during renegotiations (Alzoubi, 2018). Capital structure as measured by the total debt to total assets ratio does not contribute significantly towards signalling financial distress. The total debt to total assets ratio and total debt also

exhibits a unique pattern as we move from growth firms to mature and decline firms. The firms in the decline stage show higher debt as compared to mature firms but lesser than the growth firms. In the sample under study, firms are not increasing the debt component in the capital structure as they transition to decline stage. The consistent decrease in the debt ratios of the Indian firms can be attributed to institutional deficiencies and decline in the corporate investments (Bhatia and Kumari (2022), Chauhan, 2017). However, the debt ratios of many emerging market firms are found to be increasing Mitton (2007), along with many developed and developing market firms. Indian corporate governance model is more inclined towards the bank-based model, which makes it difficult for firms in distressed financial health to increase the debt component. It provides a possible explanation for debt not playing a significant role in predicting the financial distress in the sample firms.

Informational asymmetry is lower in large firms; hence they have lower debt, thus making size as an inverse proxy for the probability of default (Rajan & Zingales, 1995). The analysis of sample firms in the present study also suggests that the firm size and Z-score are negatively related, thus larger firms have lower Z-scores and hence a higher probability of distress. The results are supported by prior literature (Al-Hadi et al., 2019; Altman et al., 2017; Waqas et al., 2018). However, a significantly positive relationship of firm performance and Z-score suggests that better firm performance is found to indicate better financial health and a lower probability of financial distress (Waqas et al., 2018). The results of the study also provide evidence for the ability of the discretionary accruals quality to predict the financial distress for the firms in decline stage. The negative relationship between Z-score and discretionary accruals quality suggest higher Z-score leads to lesser earnings management, thus lesser chances of firm going into financial distress (Li et al., 2020). The results of the study do not provide concrete evidence for the possible impact of firm life cycle on the financial distress signalling. The transition analysis reflects that a significantly lower proportion of firms move to decline stage from the introduction and growth phase. A higher proportion of the mature firms tend to shift back to the growth stage rather than the shakeout or the decline stage. Hence, the results of the panel data regression as well as transition analysis suggest that a particular stage in the firm life cycle does not significantly affect the probability of financial distress of the firm.

6. Conclusion

6.1. Managerial implications and contribution

The present research seeks to address a gap in the literature by establishing the role of discretionary accruals and leverage in signalling the distressed financial condition of the firms for the Indian context. The results of the analysis show deviations from the hypothesized relationships based on the previous literature, which provide support for the uniqueness of the context. Another substantial contribution of the proposed model is the incorporation of the firm life cycle into the phenomenon under study.

The study has implications for a wide array of audiences ranging from investors to the auditors. Auditors can better monitor the firms and also take pricing decisions based on the financial health of the company. The research by Abbott, Parker & Peters, 2006 suggests that audit fees increases (decreases) with the income-increasing (decreasing) earnings management as income-increasing earnings management is related with the higher litigation risk and cost. In line with the results of the SEBI DRG study (2013) a higher earnings management can also signal the regulators for the need to increase surveillance of firms. Consequently, policymakers can make the policies as there is a need for better financial disclosures and regulations for protecting the investors and stake-holders. Hence, the results of the research can be utilized by the various stakeholders of the firm such as investors, regulators, auditors and policymakers in assessing the financial health of the firm based upon the earnings management activity and leverage.

6.2. Limitation and future research direction

The present study has few limitations. Firstly, the sample size of the study is affected by the availability of the data related to firm life cycle descriptors. The firms, which are included in the

study, are the firms for which the data for all the life cycle descriptors are available for at least 6 years. Similarly, for the estimation of the earnings management variable, data is needed for the last 5 years. Thus, the estimation requirements of the different constructs and the availability of data restrict the sample size under study. Secondly, the smaller sample size also poses restriction on performing industry-wise analysis. Lastly, the study uses an aggregate accruals approach, which measures discretionary accruals as the residuals $e_{i,t}$. The approach assumes that discretionary accruals are orthogonal to nondiscretionary accruals (McNichols, 2000; McNichols & Stubben, 2018). /the present research unravels a few gaps in the literature that can be explored and phenomenon that are sought to be understood. First, the sample under study does not provide an insight into the impact of firm life cycle on the discretionary accruals quality for the growth firms. It requires more in-depth study in order to understand the relationship in growth firms. Secondly, the analysis shows that the debt measured by total debt to total assets ratio does not help in predicting the financial distress. An extensive analysis with varied types of debt (secured and unsecured) rather than considering total debt could possibly help the researchers to understand the linkages in a better manner.

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Notes
1. Primarily, the sample includes the firms for which data is available for the equity dividend payments including the interim dividends and final dividends.
2. The estimation of the constructs such as the firm life cycle and the discretionary accruals requires the prior 5-year data. The details regarding estimation of constructs are discussed in the sSection 3.2 "Measurement of main constructs" of section data and methodology.
3. The life cycle descriptor, namely, capital expenditure divided by the value of the firm (CEV) has not been considered in the identification of firm life cycle as it has been excluded in the original model proposed by Anthony and Ramesh (1992) because of low explanatory power.

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