Bankruptcy Law, Creditor Rights, and Earnings Management: Evidence from India

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Abstract

This study investigates whether the implementation of a creditor-friendly bankruptcy law encourages firms to engage in earnings management. We exploit the 2016 enactment of the Insolvency and Bankruptcy Code (IBC) in India as an exogenous policy shock for this investigation. Our results show that bankruptcy risk, on average, does not motivate firms to manage their earnings. However, after the IBC was implemented in 2016, we notice an increase in firms' tendencies to indulge in earnings management when their bankruptcy risk increases. This effect is expected to be more pronounced in the cross-section of financially distressed firms, given their higher bankruptcy risk. Nevertheless, we find no evidence in support of this claim. Thus, we suggest that our findings are driven by firm managers' efforts to conceal their pursuit of empire-building activities from equity holders' scrutiny during periods of heightened bankruptcy risk. These insights may assist policymakers in evaluating the consequences of creditor-friendly bankruptcy laws with learnings for future legislative endeavours.

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1. Introduction

Bankruptcy risk is an important variable in the financial policy of firms (Titman and Wessels 1988). When bankruptcy risk rises, a firm's access to finance becomes severely restricted, as lenders and investors are wary of providing credit or investing in firms with high default probabilities (Altman and Hotchkiss 2006). This heightened perception of risk leads to increased borrowing costs and stricter lending terms, including higher collateral requirements and more restrictive covenants (Chava and Purnanandam 2010). Additionally, the reputational damage associated with higher bankruptcy risk reduces investor confidence, further limiting the firm's ability to secure funding (Brown and Matsa 2016). Consequently, firms facing elevated bankruptcy risk encounter significant challenges in obtaining the capital needed for their operations and growth.

To mitigate these financing difficulties, firms may resort to earnings management[2] to appear financially stable and enhance their creditworthiness or attractiveness to investors (Dechow *et al* 1996). This can involve manipulating financial statements by inflating revenues, deferring expenses, or adjusting accounting estimates to meet targets and covenants, creating an illusion of improved financial health (Healy and Wahlen 1999). As a result, firms under financial pressure often adopt earnings management practices to ease financing difficulties and attract or maintain investment (Badertscher 2011). For instance, Arora and Chauhan (2021) found that firms in financial distress (i.e., those at high risk of bankruptcy)[3] deliberately complicate their financial statements in order to propagate the narrative that suits their self-interests. Therefore, Saleh and Ahmed (2005) and Li *et al* (2020) argue that increased bankruptcy risk incentivises firms to engage in earnings management.

However, bankruptcy risk becomes real for firms only when creditor rights are well-enforced in a given legal system (La Porta *et al* 1998). In situations where creditors have only a weak legal claims on a defaulter's assets, firms may downplay the importance of bankruptcy risk in their financing decisions. Consequently, robust creditor rights provide the legal foundation necessary for bankruptcy risk to influence a firm's financial decisions (Bose *et al* 2021). Given that bankruptcy risk motivates firms to engage in earnings management, and this risk becomes real only when creditor rights are well-enforced within a legal system, we contend that the implementation of a creditor-friendly[4] bankruptcy law will encourage firms to engage in earnings management in periods of elevated bankruptcy risk.

In a similar vein, we note further that laws and institutions that enhance creditor rights increase the liquidation value of firms, thereby reducing the expected cost of default for creditors (Tirole 2010). For instance, Degryse *et al* (2020) demonstrate that reforms which strengthen creditor rights, through a time-bound resolution of corporate insolvencies, can alleviate the expected deadweight loss associated with collateral liquidation and improve their expected recovery rate. Consequently, when a borrower defaults on their obligations in the presence of strong creditor rights, lenders can recover more from the defaulter, thereby reducing the expected cost of default for creditors. As a result, stronger creditor rights give lenders greater confidence in recovering their investments through legal processes like liquidation or reorganisation in case of default.

This security might reduce the need for rigorous borrower monitoring, as the risk of loss is mitigated by a robust legal framework (La Porta *et al* 1998). However, it can also create a moral hazard where creditors rely more on legal protections and less on proactive oversight, potentially decreasing their vigilance (Djankov *et al* 2007). Therefore, while stronger rights provide security, they can inadvertently reduce the motivation for active oversight. Firm managers might exploit this reduced scrutiny to pursue their personal utility maximisation goals by hoarding firms' 'slack' resources for personal

consumption (Jensen and Meckling 1976; Chen *et al* 2012). This behaviour increases operating costs and subsequently reduces firm profits (Anderson *et al* 2003).

However, poor performance often leads to increased monitoring from the firm's equity holders (Healy and Palepu 2001; Brennan and Solomon 2008). Monitoring intensifies when bankruptcy risk increases, as default results in the transfer of assets from equity holders to debt holders, causing financial losses to shareholders and a loss of their control over the firm's assets (Rajan and Zingales 1995). This heightened monitoring by equity holders might expose managerial misconduct, potentially leading to the manager's dismissal. To avert this outcome, managers are incentivised to engage in earnings management and artificially inflate their firm's profits during periods of increased bankruptcy risk. Given that stronger creditor rights make bankruptcy risk more tangible for firms, it seems that within a framework of stronger creditor rights, firms will increase their engagement in earnings management when facing an elevated bankruptcy risk.

Conversely, in environments characterised by strong creditor rights, firms are compelled to maintain transparency and integrity in their financial reporting. Robust creditor rights ensure that firms are held accountable for their financial performance, as creditors have greater legal protections and enforcement mechanisms. Consequently, the penalties for earnings manipulation or misrepresentation are more severe, risking legal action[5] or other negative consequences from creditors.[6] This incentivises firms to adhere to stricter accounting standards and maintain greater transparency to avoid these repercussions (La Porta *et al* 1998; Dyck and Zingales 2004). By doing so, firms enhance their credibility and reputation among creditors and investors, and reduce the risk of financial distress or default from misstated financial performance. This alignment of incentives fosters a culture of accountability and ethical conduct, reducing the temptation and opportunity for earnings manipulation. Therefore, environments with stronger creditor rights promote financial stability, investor confidence, and the overall integrity and reliability of financial markets.

In the context of the above discussion, it is pertinent to note that the increased scrutiny of firms' performance can lead to varying effects on the practice of earnings management. Specifically, in scenarios where creditor rights are robust, creditors are likely to enhance their monitoring efforts as a result of strengthened legal standing. Consequently, the anticipated cost of manipulating earnings rises, thereby reducing the incidence of earnings management. Conversely, during periods of strong creditor rights, the heightened risk of bankruptcy prompts increased vigilance from equity holders, who seek to prevent financial losses and the forfeiture of their control over the firm's assets through default. This situation could jeopardise the employment security of firm managers, potentially motivating them to engage in earnings management. Thus, *ex-ante*, the *a priori* effects of enhanced

creditor rights on firms' earnings management practices in the context of heightened bankruptcy risk are ambiguous. We attempt to clarify this issue in this paper.

To shed light on this issue, we exploit the promulgation of a stringent creditor-in-control law, which instituted a time-bound system for the resolution of corporate insolvency cases, thereby strengthening creditor rights. We use the implementation of this law as an exogenous policy shock to investigate whether higher creditor rights affect earnings management within firms in periods of increased bankruptcy risk. In the financial year[7] 2016, the Government of India (GoI) implemented the Insolvency and Bankruptcy Code (IBC) to create a cohesive system for resolving corporate insolvency cases in a timely manner (Singh *et al* 2023). Prior to the IBC, bankruptcy cases in India were handled by multiple agencies, including the Debt Recovery Tribunals (DRTs), the Board for Industrial and Financial Reconstruction (BIFR), and conventional courts (Jadiyappa and Kakani 2023).

This fragmented approach led to inefficiency and ineffectiveness in enforcing creditor rights. For instance, before the IBC, resolving a bankruptcy case in India took an average of 10 years, with creditors recovering only 12 per cent of the asset value (Chakrabarti *et al* 2008). The legal complexities during this period weakened creditor rights, discouraging stakeholders such as firm managers, shareholders, and creditors, from making sound financial and operational decisions (Bose *et al* 2021).

To address these challenges, Indian regulators introduced the IBC in 2016 to reinforce creditor rights and improve the flow of credit within the economy. The IBC stipulates a time-bound process for resolving corporate insolvency cases, mandating resolution within 330 days, according to Section 12(3). These provisions accelerated the resolution process, reducing the average settlement time to 415 days[8] and lowering the liquidation cost to 1 per cent of the amount disbursed to stakeholders, as reported in the 2019–20 annual report of the Insolvency and Bankruptcy Board of India. Consequently, post-IBC, creditors have been able to recover assets more efficiently, increasing recovery amounts and reducing liquidation costs. Thus, the IBC reform offers us a natural laboratory to investigate the consequences of higher creditor rights on earnings management within firms, particularly during periods of elevated bankruptcy risk.

We test our assertion using data from Indian firms for the years 2011–2020. Our data are organised at the firm-year level. For our analysis, we need firm-level measures of earnings management and financial distress (i.e., bankruptcy risk). To estimate our dependent variable, i.e., earnings management, we use the model of discretionary accruals proposed in Jones (1991). Earnings management, as per Jones (1991), is measured using a model that distinguishes between discretionary and non-discretionary accruals[9] in financial statements. The Jones model assumes that total accruals (difference between net profits and operating cashflows) are composed of both

components, with non-discretionary accruals driven by economic conditions such as changes in revenue and gross fixed assets (GFA). To estimate non-discretionary accruals, the model first regresses total accruals against changes in revenue and levels of GFA.

To mitigate the issue of heteroscedasticity, Jones (1991) suggest that we scale both sides of the regression by the first lag of total assets. The use of lagged values for total assets also resolves endogeneity issues. This regression allows for the calculation of expected accruals under normal business conditions. Discretionary accruals, indicative of potential earnings management, are then identified as the residuals from this regression. By isolating discretionary accruals, the Jones model provides a systematic approach to detect deviations that may signal earnings manipulation, thus offering a critical tool for assessing the integrity of financial reporting (Jones 1991; Dechow *et al* 1995; Chauhan and Jaiswall 2023). Specifically, higher discretionary accruals indicate potential earnings management activities, as managers may be manipulating accounting figures to achieve desired financial outcomes. This method allows researchers to quantify the extent of earnings management within firms and assess its impact on financial reporting quality and market perceptions (Broadstock *et al* 2024).

To estimate financial distress, we calculate the Altman Z-score using firm-level data. This score combines several financial ratios, each weighted and aggregated, to assess the likelihood of financial distress.[10] A *lower* Z-score indicates a *higher* probability of financial distress (i.e., increased bankruptcy risk). However, a simple linear regression of earnings management on Z-score fails to capture the non-linear effects of bankruptcy risk on firms' earnings management. In other words, it cannot isolate the impact of increases and decreases in bankruptcy risk on earnings management within firms. To address this issue, we create a binary dummy variable called Decline_Dummy, which is set to 1 if the current year's Z-score is lower than the previous year's Z-score. We then interact the Z-score with Decline_Dummy to capture these non-linearities. Specifically, the interaction term Decline_Dummy × Z-score indicates an increase in a firm's bankruptcy risk, as a decline in Z-score implies higher financial distress.

Our investigation requires us to exploit time-variation in the accounting policy of firms. Therefore, we segment our study period of 10 years into the pre-IBC (2011–2015) and the post-IBC (2016–2020) periods. To isolate the implications of the IBC, we create a dummy variable, namely IBC_Dummy. This variable (IBC_Dummy) is 1 for the post-IBC period but 0 otherwise. Subsequently, to examine the influence of the IBC law during periods of increased bankruptcy risk on the practice of earnings management within firms, we separately interact IBC_Dummy with Z-score and Decline_Dummy × Z-score. Since IBC_Dummy is 1 for the post-IBC period therefore, the interaction term IBC_Dummy × Z-score captures bankruptcy risk of firms in those post-IBC years when Z-score increased over the last year.

Conversely, IBC_Dummy × Decline_Dummy × Z-score captures bankruptcy risk of firms in those post-IBC years when Z-score decreased over the last year. Thus, IBC_Dummy × Decline_Dummy × Z-score indicates an increase in a firm's bankruptcy risk in the post-IBC period. If the coefficient on this variable is positive (negative) and significant, this implies that earnings management in response to an increase in firm's bankruptcy risk is more (less) pronounced in the post-IBC period compared to the pre-IBC period. Furthermore, we include several control variables to rule out the effect of systematic cross-sectional differences on our regression estimates.

Using a piecewise linear regression analysis within a fixed effects framework[11], our findings reveal interesting outcomes for the periods after the implementation of the IBC law. During the length of our study period, bankruptcy risk, on average, did not motivate firms to engage in earnings management. However, in the post-IBC period, there is a noticeable decrease in the average magnitude of earnings management within firms compared to the pre-IBC period, which aligns with the findings of prior studies such as La Porta *et al* (1998) and Dyck and Zingales (2004). These studies highlight that stronger legal protections for creditors, particularly in countries with well-developed legal systems, are associated with lower levels of earnings manipulation. Thus, robust creditor rights enhance transparency and accountability, reducing firm manager's ability to engage in deceptive financial reporting.

Furthermore, we discover that during periods of heightened bankruptcy risk (when Decline_Dummy equals 1), firms exhibit an increased propensity for earnings management in the post-IBC period vis-à-vis the pre-IBC period. This suggests that creditor-friendly bankruptcy legislation like the IBC makes the risk of bankruptcy more significant for firms, compelling them to consider the possibility of reduced access to finance. However, this heightened earnings management may also be caused by managers attempting to conceal their pursuit of empire-building incentives from the intensified scrutiny of equity holders.

To understand the cause of our empirical observation, we test for cross-sectional heterogeneity in our data. We examine whether there is a change in earnings management among firms with a higher likelihood of bankruptcy in the pre-IBC period compared to those with a lower likelihood. Firms with a higher probability of bankruptcy are more financially distressed than those with a lower probability. If financial distress leads to earnings management in the post-IBC period as a result of restricted access to finance, then firms with a higher probability of bankruptcy should exhibit a greater tendency toward earnings management. We compute a dummy variable, Z_Dummy, which takes the value of 1 if a firm's Z-score in the pre-IBC period averaged 1.80 or less, otherwise 0 (Altman 2013; Singh *et al* 2021). By using pre-IBC information, we avoid look-ahead bias in our estimation.

We then interact Z_Dummy with IBC_Dummy to estimate the impact of the IBC's legislation on earnings management by firms with a higher probability

of bankruptcy. The coefficient on this variable is positive but insignificant, indicating that the promulgation of the IBC reform in 2016 failed to incentivise firms, which had a higher probability of bankruptcy in the pre-IBC period, to increase their earnings management any more in the post-IBC period compared to the pre-IBC period. Thus, our findings suggest that the observed increase in earnings management stems from the empire-building incentive of firm managers.

This study contributes to the literature on the costs and benefits of creditor-friendly bankruptcy laws, positing that such legislation offers both drawbacks and advantages, particularly by affecting firms' accounting policies. Previous research emphasising the costs of creditor-friendly laws indicates several negative outcomes: reduced firm-level innovation (Acharya and Subramanian 2009), inefficient liquidation (Acharya *et al* 2011), diminished corporate risk-taking (Acharya *et al* 2011), lower utilisation of collateralised debt (Vig 2013), and negative effects on corporate investments (Favara *et al* 2017). Conversely, proponents of the benefits of this legislation argue that stricter bankruptcy codes can discipline managers, thereby increasing investment and reducing debt costs (Bolton and Scharfstein 1996).

Our study makes a multifaceted contribution. First, we demonstrate that creditor-friendly bankruptcy laws, such as the IBC, heightens financial scrutiny by firms' creditors, compelling firms to enhance transparency in their financial disclosures. This increased scrutiny results in a reduction in earnings management, aligning with existing literature that highlights the benefits of creditor-friendly legislation. In this regard, our study aligns with the findings of La Porta *et al* (1998) and Dyck and Zingales (2004). However, we also observe that such legislation increases earnings management during periods of increased bankruptcy risk. This increase in earnings manipulation during distress is driven by managers' attempts to conceal their pursuit of empire-building incentives, in order to avert negative repercussions on their career. Thus, our study also contributes to the literature by highlighting a potential drawback of creditor-friendly laws. These findings are particularly relevant for policymakers, as they provide insights into the effectiveness and unintended consequences of creditor-friendly laws, thereby informing the development of more balanced and effective policies in the future.

The remainder of this paper is organised as follows: Section 2 covers the development of our hypothesis. Following that, Section 3 addresses data and methodological considerations. Thereafter, in Section 4 we present a discussion of our empirical results. Lastly, in Section 5 we conclude our study.

2. Hypotheses

A firm's access to finance is inversely associated with its agency cost, bankruptcy risk, information asymmetry, and other random forces (Rajan and Zingales 1995). Thus, a rise in bankruptcy risk, *ceteris paribus*, imposes restrictions on a firm's ability to raise debt and equity capital. Therefore,

bankruptcy risk plays an important role in the determination of a firm's financial policy. However, bankruptcy risk becomes real for firms only when creditor rights are well protected in a given legal system (La Porta *et al* 1998). Thus, creditor rights and bankruptcy risk are directly associated (Araujo *et al* 2012). Therefore, it follows that higher creditor rights decrease a firm's access to finance in periods of increased bankruptcy risk. To alleviate the financial challenges posed by robust creditor rights, firms might engage in earnings management practice to present themselves as financially stable, thereby improving their creditworthiness and attractiveness to lenders and investors respectively (Dechow *et al* 1996).

We further argue that higher creditor rights, bolstered by legal frameworks, enhance the liquidation value of firms, reducing the cost of default for creditors (Tirole 2010). This assurance diminishes the necessity for intense borrower monitoring, as creditors rely on legal recourse for debt recovery (La Porta *et al* 1998; Djankov *et al* 2007). However, it can breed moral hazard, where creditors slacken oversight, enabling managerial opportunism. Managers may exploit reduced scrutiny for the pursuit of empire-building incentives, depleting firm resources, elevating operating costs, and depressing profits (Anderson *et al* 2003; Chen *et al* 2012). However, underperformance triggers heightened equity holder monitoring, especially in bankruptcy-prone scenarios, aiming to curb managerial misconduct (Healy and Palepu 2001; Brennan and Solomon 2008). To evade repercussions such as dismissal from current employment, managers might resort to earnings management during periods of increased bankruptcy risk. Thus, under robust creditor rights, firms tend to engage more in earnings management amid increased bankruptcy risks.

Alternatively, robust creditor rights might compel firms to maintain transparency and integrity in financial reporting. These rights hold firms accountable for performance, backed by legal protections for creditors. This environment heightens consequences for earnings manipulation, potentially leading to legal action or creditor backlash (La Porta *et al* 1998; Dyck and Zingales 2004). Consequently, firms are incentivised to adhere to stringent accounting standards, fostering credibility and reducing the risk of financial distress. Thus, strong creditor rights promote stability, investor confidence, and market integrity.

Based on above discussion, we cannot *a priori* predict the *ex-ante* consequences of the IBC, which increases creditor rights within India, on earnings management by firms under conditions of heightened bankruptcy risk. Therefore, we propose the following null hypothesis:

H1: The IBC had no impact on the practice of earnings management by firms in periods of increased bankruptcy risk.

Firms which had a higher probability of bankruptcy (high bankruptcy risk firms) in the pre-IBC period are at greater risk of financial distress compared to firms which had a lower probability of bankruptcy (low bankruptcy risk

firms). Therefore, if firms engage in earnings management to alleviate the issue of reduced access to finance, then high bankruptcy risk firms have a stronger incentive to manage their earnings in the post-IBC period than low bankruptcy risk firms.

Alternatively, if firms indulge in earnings management in the post-IBC period to conceal their manager's pursuit of empire-building incentives from the increased scrutiny of lenders, then high bankruptcy risk firms should demonstrate no higher degree of earnings management compared to low bankruptcy risk firms.

Given the above discussion, we propose our second null hypothesis as follows:

H2: The IBC had no differential impact on the degree of earnings management by firms which had a higher probability of bankruptcy in the pre-IBC period than firms which had a lower probability of bankruptcy.

3. Data and Methodology

3.1. Data

Our panel comprises non-financial publicly listed firms in India for the period 2011–2020. We do not include financial firms in our sample because the high leverage typical of these firms would usually imply financial distress for non-financial entities (Fama and French 1992). Furthermore, we only focus on listed firms because the accounting data available for unlisted firms is unreliable (Chopra *et al* 2021).

We collect data on our sample from the Centre for Monitoring Indian Economy (CMIE)'s Prowess database. The CMIE is an independent research organisation, which compiles economic and business datasets concerning the Indian economy. Its Prowess database gathers information from various sources such as annual reports, quarterly financial statements, and stock exchange data. Several notable studies in the past have used this database for their empirical investigation (for instance, see Vig 2013; Manchiraju and Rajgopal 2017; Bose *et al* 2021; Kariya 2021; Rajgopal and Tantri 2023).

We segment our study period of 10 years into the pre-IBC (2011–2015) and the post-IBC (2016–2020) periods to assess time-variation in the accounting policy of firms around the passage of the IBC law in 2016. To ensure meaningful comparison, we only retain those firms in our sample on which the complete financial information of our interest is available. Thus, our data collection process yields us 4,448 firm-year observations for the length of our study period. We have 2,224 firm-year observations for both the pre- and the post-IBC periods. Table 1 provides the definition of variables used in this study.

Table 1: Definition of variables

This table presents a brief description of the variables used in the study. For the purpose of interpretation, i represents a firm in our sample and t is time in years.

Variables	*Definition*
Earnings management	The absolute value of residuals ($\|\varepsilon^i_t\|$) obtained from the regression suggested in Jones (1991) proxies for earnings management: (Total accruals^i_t/Total assets$^i_{t-1}$) = α_1 (1/Total assets$^i_{t-1}$) + α_2 (ΔSales^i_t/Total assets$^i_{t-1}$) + α_3 (Gross fixed assets^i_t/Total assets$^i_{t-1}$) + ε^i_t
Financial distress	We use the Altman Z-score to proxy a firm's financial distress. The Altman Z-score, as discussed by Mackie-Mason (1990), is a financial metric used to predict the likelihood of a firm going bankrupt. It is calculated as: 3.3*(EBIT^i_t/Total assets^i_t) + 1.0*(Sales^i_t/Total assets^i_t) + 1.2*(Working capital^i_t/Total assets^i_t) + 1.4*(Retained earnings^i_t/Total assets^i_t)
ROA	Return on total assets, calculated as EBIT^i_t/Total assets^i_t
Liquidity	(Current assets^i_t – Current Liabilities^i_t)/Total assets^i_t
Tangibility	Net fixed assets^i_t/Total assets^i_t
Leverage	Debt^i_t/Total assets^i_t
Size	Natural log of total assets^i_t

3.2. Methodology and the specification of empirical strategy

Previous research indicates that the introduction of the IBC in 2016 resulted in an enhancement of creditor rights within the legal framework of India, as evidenced by studies conducted by Gopalan *et al* (2016), Bose *et al* (2021), Singh *et al* (2021), Singh *et al* (2022), Agarwal and Singhvi (2023), Singh *et al* (2023) and Srivastava (2024). As bankruptcy risk becomes a tangible concern for firms only when creditor rights are well-enforced within a given legal jurisdiction, the implementation of the IBC offers a unique opportunity to examine time-variation in the accounting policy of firms in response to heightened bankruptcy risk.

In formulating our empirical framework, we draw upon the research conducted by Anderson *et al* (2003) regarding the phenomenon of sticky cost behaviour. Anderson *et al* (2003) explored the asymmetry in the responsiveness of selling, general, and administrative (SG&A) costs to changes in a firm's

sales volume. They employed a piecewise linear regression model using data spanning two decades from 7,629 US firms to capture this asymmetry, enabling the identification of periods characterised by sales increases and decreases. Their analysis revealed that SG&A costs exhibit a greater increase in response to rising sales compared to their decrease for a commensurate reduction in sales. Building upon the methodology of Anderson *et al* (2003), our study aims to delineate periods of heightened bankruptcy risk to investigate its effects on firms' earnings management practices. Consequently, our empirical model is formulated as an adaptation of the approach outlined in Anderson *et al* (2003):

$$Earnings\ Management^{i}_{t} = \alpha + \beta_1 Z\text{-}score^{i}_{t} + \beta_2 Decline\_Dummy \times Z\text{-}score^{i}_{t} + \varepsilon^{i}_{t} \qquad (1)$$

where, *Earnings Management* of firm i in year t is estimated from the model of discretionary accruals proposed in Jones (1991). In Jones (1991), earnings management is quantified through a model that distinguishes between discretionary and non-discretionary accruals within financial statements. The model assumes that total accruals (difference between net profits and operating cashflows) consist of two components: non-discretionary accruals driven by economic factors such as changes in sales and levels of GFA, and discretionary accruals, which reflect managerial choices to manipulate reported earnings.

To estimate non-discretionary accruals, the model performs an Ordinary Least Squares (OLS) regression of total accruals on changes in sales and levels of GFA, adjusting for lagged total assets to mitigate issues of endogeneity and heteroscedasticity. The absolute value of the residuals from this regression represent discretionary accruals, serving as proxies for earnings management activities. We use the absolute value of the residuals to prevent the offsetting of positive and negative observations (Arora and Chauhan 2021). By separating discretionary accruals from non-discretionary components, the Jones model provides a framework to analyse and quantify potential earnings management practices within firms, offering insights into financial reporting integrity and managerial behaviour (Broadstock *et al* 2024).

The *Z-score* represents the Altman Z-score of firm i in year t, and *Decline_ Dummy* is a binary variable set to 1 if the current year's *Z-score* is lower than the previous year's *Z-score*, and 0 otherwise. *Decline_Dummy* is used to capture potential non-linear relationships between earnings management and bankruptcy risk at the firm level. This approach allows us to investigate whether earnings management differs during periods of elevated versus reduced bankruptcy risk. By including this dummy variable, we can account for structural differences in how firms manage earnings depending on changes in their bankruptcy risk. This helps determine whether earnings management increases more during heightened bankruptcy risk periods compared to periods of lower risk. A decrease in *Z-score* signifies an increased bankruptcy risk (Mackie-Mason, 1990). Thus, the interaction term *Decline_Dummy* × *Z-score* identifies periods of increased bankruptcy risk. The disturbance term is denoted as ε. For definition of variables, refer to Table 1.

Interpreting the interaction between a dummy variable and a continuous variable in regressions involves examining how the effect of the continuous variable changes based on the dummy variable's presence (Aiken and West 1991). For instance, in a regression model, if a dummy variable D interacts with a continuous variable X (denoted as D × X), it helps assess whether the impact of X on the outcome Y changes when D shifts from 0 to 1. A positive coefficient for D × X indicates that the effect of X on Y is stronger (or weaker) when D is 1 compared to when D is 0. This approach helps researchers understand how the relationship between X and Y varies based on the inclusion of the dummy variable D. In our model, the dependent variable Y is *Earnings Management*, the continuous variable X is *Z-score*, and the binary dummy variable D is *Decline_Dummy*. Therefore, the interaction of *Decline_Dummy* with *Z-score* captures the effect of *Z-score* on *Earnings Management* when *Decline_Dummy* is 1 compared to when it is 0.

Decline_Dummy is set to 0 in years when the current year's *Z-score* is higher than the previous year's *Z-score*. Consequently, when a firm's *Z-score* improves, the coefficient β_2 is 0, indicating lower or the same level of bankruptcy risk as the year before. Thus, β_1 measures the impact of a 1-point decrease in firm's bankruptcy risk on its earnings management. When *Decline_Dummy* is 1, β_2 is not *a priori* 0, and $(\beta_1+\beta_2)$ measures the impact of a 1-point increase in firm's bankruptcy risk on its earnings management. A positive and significant β_1 indicates higher earnings management in response to *decreased* bankruptcy risk, while a positive and significant $(\beta_1+\beta_2)$ suggests increased earnings management in response to *increased* bankruptcy risk. Therefore, β_2 captures the differing effect of bankruptcy risk on a firm's earnings management when the risk increases compared to when it decreases. A positive (negative) and significant β_2 suggests that firms amplify (reduce) the intensity of their earnings management more in periods of increased bankruptcy risk compared to periods of reduced bankruptcy risk.

However, the above specification (1) is not suitable for our purposes since our interest lies in studying time-variation in the accounting policy of firms in the context of the IBC's implementation in India in 2016. Therefore, we introduce another indicator variable, namely *IBC_Dummy*, which is 1 for the post-IBC period but 0 otherwise. This strategy of delineating periods of higher and lower creditor rights is adopted from Singh *et al* (2021) and Dai *et al* (2023).[12] To estimate the impact of the IBC law during periods of increased bankruptcy risk on the practice of earnings management within firms, we separately interact *IBC_Dummy* with *Z-score* and *Decline_Dummy* × *Z-score*. This leads to a modification of equation (1) as:

$$\begin{aligned} \textit{Earnings Management}^i_t = {} & \alpha + \beta_1 \textit{Z-score}^i_t + \beta_2 \textit{Decline\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_3 \textit{IBC\_Dummy} + \beta_4 \textit{IBC\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_5 \textit{IBC\_Dummy} \times \textit{Decline\_Dummy} \times \textit{Z-score}^i_t + \varepsilon^i_t \end{aligned} \quad (2)$$

In the preceding specification (2), the coefficient β_3 on *IBC_Dummy* measures the mean value of our dependent variable, i.e., *Earnings Management* for the post-IBC period compared to the pre-IBC period. Since *IBC_Dummy* is 1 for the post-IBC years but 0 otherwise, therefore, β_3 estimates on average the impact of the enactment of the IBC reform in 2016 on the extent of earnings management within firms. A positive (negative) and significant β_3 signals higher (lower) intensity of earnings management within firms in the post-IBC period compared to the pre-IBC period.

The variable *IBC_Dummy* × *Z-score* represents an interaction between a dummy variable (*IBC_Dummy*) and a continuous variable (*Z-score*). *IBC_Dummy* equals 1 for the post-IBC period and 0 for the pre-IBC period. Thus, the coefficient β_4 on *IBC_Dummy* × *Z-score* estimates the differing impact of *Z-score* on a firm's earnings management in the post-IBC period compared to the pre-IBC years. An increase in *Z-score* indicates a decrease in a firm's bankruptcy risk. Therefore, β_4 estimates, on average, how earnings management changes within firms when their bankruptcy risk decreases by 1-point in the post-IBC period vis-à-vis a decrease of a similar magnitude in the pre-IBC period. A positive (negative) and significant β_4 suggests that firms, in response to a *decrease* in their bankruptcy risk, increase (decrease) their earnings management more in the post-IBC period compared to the pre-IBC period.

Similarly, the coefficient β_5 on *IBC_Dummy* × *Decline_Dummy* × *Z-score* measures the differing impact of a decrease in *Z-score* on a firm's earnings management in the post-IBC years compared to the pre-IBC period. A decrease in *Z-score* indicates an increase in a firm's bankruptcy risk. Therefore, β_5 estimates, on average, how earnings management changes within firms when their bankruptcy risk increases by 1-point in the post-IBC period relative to an increase of a similar magnitude in the pre-IBC period. A positive (negative) and significant β_5 suggests that firms, in response to an *increase* in their bankruptcy risk, increase (decrease) their earnings management more in the post-IBC period compared to the pre-IBC period.

We further add control variables in our specification (2) to limit the influence of systematic cross-sectional differences on our regression estimates. Our selection of control variables is premised on the intuition that firms with greater access to finance face lower outside scrutiny, which decreases their incentive to engage in earnings management. In the literature on the financial policy of firms, access to finance depends upon agency cost, bankruptcy risk, information asymmetry, and other random forces (Titman and Wessels 1988; Rajan and Zingales 1995). Therefore, we use firm-level measure of these factors from Li and Islam (2019) and alter the preceding specification (2) as follows:

$$\begin{aligned} \textit{Earnings Management}^i_t = {} & \alpha + \beta_1 \textit{Z-score}^i_t + \beta_2 \textit{Decline\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_3 \textit{IBC\_Dummy} + \beta_4 \textit{IBC\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_5 \textit{IBC\_Dummy} \times \textit{Decline\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_6 \textit{ROA}^i_t + \beta_7 \textit{Liquidity}^i_t + \beta_8 \textit{Tangibility}^i_t \\ & + \beta_9 \textit{Leverage}^i_t + \beta_{10} \textit{Size}^i_t + \varepsilon^i_t \end{aligned} \quad (3)$$

The aforementioned specification (3) is appropriate for testing our first hypothesis (*H1*). We reject *H1* if β_5 is found to be either positive or negative and statistically significant. However, specification (3) is inadequate for examining our second hypothesis (*H2*). This limitation arises because testing *H2* necessitates the inclusion of a measure of the firm's probability of bankruptcy within our regression framework. To address this requirement, we construct an indicator variable, *Z_Dummy*, which is assigned a value of 1 if the pre-IBC average *Z-score* of a firm is 1.80 or lower, otherwise *Z_Dummy* is 0. According to Altman (2013), firms with a higher likelihood of bankruptcy consistently exhibit a Z-score below 1.80.

To investigate the effect of a firm's pre-IBC average financial distress on its post-IBC earnings management, we interact the *Z_Dummy* variable with the *IBC_Dummy* variable, resulting in the interaction term *IBC_Dummy* × *Z_Dummy*. This leads to a modification of our specification (3) as:

$$\begin{aligned} \textit{Earnings Management}^i_t = {} & \alpha + \beta_1 \textit{Z-score}^i_t + \beta_2 \textit{Decline\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_3 \textit{IBC\_Dummy} + \beta_4 \textit{IBC\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_5 \textit{IBC\_Dummy} \times \textit{Decline\_Dummy} \times \textit{Z-score}^i_t \\ & + \beta_6 \textit{ROA}^i_t + \beta_7 \textit{Liquidity}^i_t + \beta_8 \textit{Tangibility}^i_t \\ & + \beta_9 \textit{Leverage}^i_t + \beta_{10} \textit{Size}^i_t + \beta_{11} \textit{Z\_Dummy} \\ & + \beta_{12} \textit{IBC\_Dummy} \times \textit{Z\_Dummy} + \varepsilon^i_t \end{aligned} \quad (4)$$

In the above specification (4), the coefficient on the variable *IBC_Dummy* × *Z_Dummy*, i.e., β_{12} estimates the differing sensitivity of a firm's earnings management to its likelihood of bankruptcy in the post-IBC period vis-à-vis the pre-IBC period. A positive (negative) and significant coefficient on the interaction variable implies that the enactment of the IBC into a law in 2016 incentivised firms, which had a higher probability of bankruptcy in the pre-IBC period, to increase (decrease) the extent of their earnings management more in the post-IBC period relative to the pre-IBC period. A positive or negative and statistically significant β_{12} will cause us to reject *H2*.

We estimate panel specifications (3) and (4) through fixed effects (FE) regression analysis to control for the impact of firm-specific time-invariant factors on our regression estimates. The choice to use FE regression analysis was based on Hausman test (Hausman 1978). We also show pooled OLS and random effects (RE) estimates as alternative specifications to demonstrate the robustness of our estimates. The estimates are corrected for conditional heteroscedasticity to obtain robust standard errors. Table 2 provides summary statistics for the variables of this study. We document the pairwise correlation between variables in Table 3.

We observe significant variability in our variables of interest. For instance, the average magnitude of *Earnings Management* was 0.033 with a standard deviation of 6.9 per cent during the pre-IBC period. However, after the introduction of the IBC in 2016, the average magnitude of *Earnings Management* declined to 0.027, with the standard deviation falling to 4.8 per cent. This

Table 2: Summary statistics

This table presents summary statistic on the variables used in the study for both the pre-IBC and the post-IBC periods.

Variables	*Pre-IBC*		*Post-IBC*		*Difference*	
	Mean	*Std. dev.*	*Mean*	*Std. dev,*	*Mean*	*t-value*
Earnings management	0.033	0.069	0.027	0.048	0.006	3.367
Financial distress	0.828	1.003	0.815	0.975	0.013	0.438
ROA	3.064	4.798	3.040	4.593	0.024	0.170
Liquidity	0.057	0.120	0.076	0.137	–0.019	–4.921
Tangibility	0.167	0.206	0.160	0.202	0.007	1.144
Leverage	0.062	0.103	0.048	0.083	0.014	4.992
Size	4.411	4.270	3.926	4.499	0.485	3.688

Table 3: Pairwise Correlation Matrix

This table summarizes the pairwise correlation among variables used in this study.

Variables	*Z-score*	*Decline_Dummy × Z-score*	*ROA*	*Liquidity*	*Tangibility*	*Leverage*	*Size*
Z-score	1.000						
Decline_Dummy × Z-score	0.190	1.000					
ROA	0.368	0.037	1.000				
Liquidity	0.238	0.075	0.177	1.000			
Tangibility	–0.161	–0.086	0.015	–0.528	1.000		
Leverage	–0.258	–0.112	–0.216	–0.209	0.366	1.000	
Size	–0.185	0.000	0.215	–0.119	–0.016	0.042	1.000

decrease of 0.006 in the mean value of *Earnings Management* from the pre-IBC period to the post-IBC period is statistically significant at the 1 per cent level, as indicated by the corresponding t-statistic of 3.367.

From Table 3, it is apparent that no variable used in this study is highly correlated with any other variable. For a formal test of multicollinearity, we obtain the variance inflation factor (VIF) for each variable in our vector of firm-specific time-varying variables. This vector includes *Z-score, Decline_Dummy × Z-score, ROA, Liquidity, Tangibility, Leverage,* and *Size*.[13] To obtain VIF, we regress each variable in our vector on other firm-specific variables. These regressions incorporate firm fixed effects to mitigate the influence of firm-level time-invariant unobserved heterogeneity on our regression estimates. Furthermore, we cluster standard errors at the firm level to correct for

conditional heteroscedasticity. Subsequently, we compute the VIF for each variable in our vector as the inverse of ($1 - R^2$ of each regression). We document VIF results in Table 4 below.

Table 4: Variance Inflation Factor (VIF)

This table documents the variance inflation factor (VIF) of variables used in the study. For definition of these variables, refer to Table 1.

Variables	*VIF*	*1/VIF*
Z-score	5.56	0.179
Decline_Dummy × Z-score	1.55	0.647
ROA	3.24	0.308
Liquidity	2.23	0.449
Tangibility	5.71	0.175
Leverage	2.60	0.384
Size	7.90	0.126
Mean VIF	4.11	

Table 4 sheds clarity on the VIF of variables used in our study. Curto and Pinto (2011) advocate a VIF of no more than 10. We note that variables used in our study, in alignment with advice of Curto and Pinto (2011), have a VIF of less than 10. Moreover, we document a mean VIF across our variables of just 4.11. This ensures that our estimates do not suffer from multicollinearity.

4. Results and Discussion

The findings of our empirical analysis are detailed in Table 5. The coefficient on *Z-score* variable (β_1) is negative but statistically insignificant (column 1, coefficient = –0.002, t-statistic = –0.31). If an inverse relationship exists between the *Z-score* and bankruptcy risk, an increase in a firm's *Z-score* over the past year should correspond to a decrease in its bankruptcy risk. Consequently, the insignificance of β_1 indicates that bankruptcy risk, on average, does not motivate firms to engage in earnings management. Similarly, the coefficient on the interaction variable *Decline_Dummy* × *Z-score* (β_2) is also negative and insignificant (column 1, coefficient = –0.003, t-statistic = –1.36).

Given that *Decline_Dummy* is set to 1 only in years where the firm's *Z-score* is lower than the previous year, *Decline_Dummy* × *Z-score* represents periods of heightened bankruptcy risk. The insignificance of β_2 suggests that increased bankruptcy risk also does not incentivise firms to manage their earnings more or less compared to periods of lower bankruptcy risk. Thus, on average, changes in a firm's bankruptcy risk, whether increasing or decreasing, has no significant impact on the firm's earnings management practices.

Table 5: Regression analysis results

This table presents the result of our regression analysis as outlined in models (3) and (4). Pooled OLS and Random Effects (RE) estimates are reported alongside Fixed Effects (FE) estimates for robustness test of our results. Parentheses enclose t-statistics for FE and Pooled OLS estimates and z-statistics for RE estimates. In the table below, ***, **, and * indicate significance at 1%, 5%, and 10% levels respectively.

Variables	*Earnings Management (1)*	*Earnings Management (2)*	*Earnings Management (3)*	*Earnings Management (4)*	*Earnings Management (5)*	*Earnings Management (6)*
	FE Estimator	*FE Estimator*	*Pooled OLS*	*Pooled OLS*	*RE Estimator*	*RE Estimator*
Constant	0.086 (1.31)	0.088 (1.30)	0.095*** (11.28)	0.089*** (7.89)	0.100*** (7.56)	0.112*** (5.65)
Z-score	–0.002 (–0.31)	–0.003 (–0.40)	0.006** (2.05)	0.008** (1.98)	0.003 (0.96)	0.001 (0.20)
Decline_ Dummy × Z-score	–0.003 (–1.36)	–0.003 (–1.44)	–0.002 (–1.39)	–0.002 (–1.39)	–0.002 (–1.32)	–0.003 (–1.45)
IBC_Dummy	–0.018** (–2.26)	–0.026 (–1.38)	–0.014** (–2.28)	–0.008 (–0.72)	–0.016** (–2.02)	–0.021 (–1.18)
IBC_Dummy × Z-score	0.001 (0.34)	0.003 (0.50)	0.000 (0.08)	–0.001 (–0.32)	0.001 (0.29)	0.002 (0.41)
IBC_Dummy × Decline_ Dummy × Z-score	0.007** (2.53)	0.008** (2.66)	0.006*** (2.61)	0.006*** (2.61)	0.007*** (2.62)	0.007*** (2.56)
ROA	0.001** (2.57)	0.001** (2.55)	0.000 (1.56)	0.000 (1.61)	0.000* (1.91)	0.000** (2.08)
Liquidity	0.010 (0.51)	0.011 (0.51)	0.022** (2.27)	0.022** (2.28)	0.017 (1.17)	0.018 (1.27)
Tangibility	–0.007 (–0.29)	–0.007 (–0.28)	–0.037*** (–4.94)	–0.037*** (–4.94)	–0.032*** (–2.68)	–0.031*** (–2.56)
Leverage	–0.027 (–1.28)	–0.027 (–1.28)	0.012 (1.26)	0.013 (1.28)	–0.001 (–0.13)	–0.002 (–0.14)
Size	–0.002 (–0.32)	–0.002 (–0.32)	–0.003*** (–7.81)	–0.003*** (–7.84)	–0.004*** (–4.93)	–0.004*** (–4.98)
Z_Dummy		Omitted due to collinearity		0.004 (0.95)		–0.009 (–1.08)
IBC_Dummy × Z_Dummy		0.005 (0.56)		–0.004 (–0.68)		0.003 (0.37)
Observations	4,448 firms-year observations	4,448 firms-year observations	4,448 firms-year observations	4,448 firms-year observations	4,448 firms-year observations	4,448 firms-year observations
R-squared	0.0508 (or 5.08%)***	0.0499 (or 4.99%)***	0.0462 (or 4.62%)	0.0463 (or 4.63%)	0.0452 (or 4.52%)***	0.0456 (or 4.56%)***

In contrast, the coefficient on *IBC_Dummy* (β_3) is negative and statistically significant. As *IBC_Dummy* is 1 for the post-IBC period but 0 otherwise, a significant and negative coefficient on *IBC_Dummy* indicates a decrease in the extent of earnings management by firms in the post-IBC period when compared to the pre-IBC period. This result aligns with the findings of La Porta *et al* (1998) and Dyck and Zingales (2004), who argue that robust creditor rights are linked with increased financial disclosure and transparency.

However, the coefficient on *IBC_Dummy* × *Z-score* (β_4) is positive but statistically insignificant (column 1, coefficient = 0.001, t-statistic = 0.34). It is pertinent to note that an increase in a firm's *Z-score* corresponds to a decrease in its bankruptcy risk. Consequently, we contend that a reduction in a firm's bankruptcy risk during the post-IBC period does not influence the firm's motivation to manage its earnings anymore when compared to the pre-IBC period. Conversely, the coefficient on *IBC_Dummy* × *Decline_Dummy* × *Z-score* (β_5) is positive and statistically significant (column 1, coefficient = 0.007, t-statistic = 2.53). We interpret this significant and positive coefficient on *IBC_Dummy* × *Decline_Dummy* × *Z-score* as an indication that, following the IBC's implementation, firms indulged in earnings management more in response to an elevated risk of bankruptcy compared to the pre-IBC period. These results for the post-IBC period suggest that a decrease in a firm's bankruptcy risk has no effect on its earnings management practices, whereas an increase in a firm's bankruptcy risk prompts firm managers to manipulate financial disclosures to obscure the deterioration of their firm's financial condition.

In conclusion, the implementation of the IBC, which enhanced creditor rights, made the risk of bankruptcy more imminent for firms and motivated managers to engage in earnings management. Thus, we reject our first null hypothesis, *H1*.

At this juncture, there exists ambiguity regarding the motivations of firms to engage in earnings management during the post-IBC period, particularly in the context of heightened bankruptcy risk. On the one hand, the enhancement of creditor rights resulting from the implementation of the IBC law has rendered the threat of bankruptcy more tangible for firms. This development has potentially restricted firms' access to finance in the post-IBC period, prompting them to increase earnings management as a compensatory measure. Consequently, the extent of earnings management is expected to be more pronounced among firms with a higher probability of bankruptcy compared to those with a lower likelihood of bankruptcy, given the greater degree of financial distress in the former. Conversely, earnings management may also be driven by firm managers' attempts to obscure their pursuit of empire-building incentives from the scrutiny of equity holders.

To shed clarity on this issue, we hypothesise that firms with a higher probability of bankruptcy in the pre-IBC period (average pre-IBC *Z-score* of 1.80 or less) will exhibit a more pronounced response to the implementation

of the IBC law. We focus on the pre-IBC period to compute the firm's *ex-ante* probability of bankruptcy to avoid look-ahead bias. Accordingly, we anticipate that the coefficient on *IBC_Dummy* × *Z_Dummy* (β_{12}) will be positive and significant. Should this hypothesis be confirmed, it would suggest that firms' tendencies to manage earnings in response to increased bankruptcy risk are more pronounced among financially distressed firms in the post-IBC period compared to the pre-IBC period. However, contrary to our expectations, we find that the coefficient β_{12} is positive but insignificant (column 2, coefficient = 0.005, t-statistic = 0.56).

Thus, our findings indicate that the enhancement of creditor rights encourages firm managers to obscure their empire-building incentives through earnings management when confronted with an increased bankruptcy risk. This implies that firms respond to an increase in their bankruptcy risk, rather than to the absolute level of bankruptcy risk, in their decision to manage earnings. These results align with the prospect theory proposed by Kahneman and Tversky (1979). Thus, we do not reject our second null hypothesis, *H2*.

5. Conclusions

This study investigates the consequences of higher creditor rights on the incentive of firms to practice earnings management when faced with increased bankruptcy risk. We find that, on average, changes in firms' bankruptcy risk has no significant effect on their decision to manage their earnings. However, in years post the enactment of the IBC law firms, on average, lowered their indulgence in earnings management. This aligns with the discovery of La Porta *et al* (1998) and Dyck and Zingales (2004), who assert that stronger creditor rights increases financial disclosure and leads to lower earnings management. Furthermore, we also document an increase in the extent of firm's earnings management when confronted with an increased risk of bankruptcy in the post-IBC period compared to the pre-IBC period. As far as motive is concerned, our tests in the cross-section of financially distressed firms indicates that stronger creditor rights increases lenders' scrutiny of financial transactions and disclosures. This causes firm managers to obscure their pursuit of empire-building incentives in order to avoid negative repercussions such as dismissal from the job.

Our work makes a significant contribution to the literature on costs and benefits of the IBC by clarifying the role of creditor rights in the decision of firms to commit malpractices such as earnings management. The results documented above carry important lessons for various stakeholders. To elaborate, our findings are of particular significance for policymakers because it might aid them learn about the effectiveness and the unanticipated consequences of the IBC. Prior studies on the IBC such as Gopalan *et al* (2016), Bose *et al* (2021), Singh *et al* (2021), Singh *et al* (2022), and Singh *et al* (2023), celebrated IBC's success in increasing firms' access to finance. However, this is amongst the first study to document how a creditor-friendly bankruptcy reform might lead

to higher instances of misrepresentation and fraud. Thus, our work may guide policymakers in future legislative activities.

Second, our findings also have managerial implications. A key takeaway from our work is that managers need to aware of possible reforms that may negatively affect profitability and survival of their firms. Awareness of such reforms might help managers take appropriate steps to ensure the long-run survival of their firms. Third, our findings also carry implications for investors. We advise investors to pay close attention to the accounting policy and practices of their firms. Otherwise, their managers may manipulate financial disclosures in periods of higher creditor rights, which may lower equity holders' welfare in the long run.

However, our work suffers from the limitation that it is grounded in the institutional framework of India. The corporate landscape of India has certain idiosyncratic features such as family-control of businesses and concentrated ownership, which limits generalisability of our findings to other geographies. Thus, a cross-country study is necessary to resolve this issue.

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Endnotes

1. Aaraadhya Srivastava: Ph.D. Scholar, Economics and Public Policy Area, Indian Institute of Management Raipur, Email: 22fpm001@iimraipur.ac.in. I am grateful to the Editor-in-chief Dr Chunping Liu, the Associate Editor, and two anonymous referees for their invaluable feedback and suggestions. The views expressed are personal. I disclose no conflict of interest.

2. Earnings management refers to the manipulation of financial statements by firm management to either meet certain benchmarks or influence perceptions of financial performance. It involves the use of accounting techniques to produce financial reports that may paint a desired picture of a firm's financial health, rather than an accurate one (Healy and Wahlen 1999).

3. We use terms 'bankruptcy risk' and 'financial distress' interchangeably throughout the paper, unless otherwise specified.

4. A creditor-friendly bankruptcy law is a legal framework that prioritises the rights and interests of creditors during bankruptcy proceedings. These laws aim to enhance the ability of creditors to recover their investments when a debtor defaults.

5. As per Section 17 of the Indian Contract Act, 1872, 'The suggestion, as a fact, of that which is not true by one who does not believe it to be true' constitutes a fraud. Thus, use of such accounting practices that present an optimistic image of a firm's business activities and financial condition, i.e., earnings management, can be classified as a fraud.

6. Section 447 of the Indian Companies Act 2013 states that a person found guilty of fraud can be punished with imprisonment of duration as short as 6 months to as long as 10 years. Such a person shall also be liable to pay fines up to three times the amount involved in the fraud.

7. A financial year (FY) in India spans a period of 12 months from 1 April of the current year to 31 March of the subsequent year. For instance, financial year 2016 commenced on 1 April 2015 and concluded on 31 March 2016.

8. The corporate insolvency resolution process (CIRP) is required to be completed within 330 days. However, cases from the pre-IBC era (under the Sick Industries Companies Act (SICA)) that were later admitted under the IBC have encountered significant delays. According to the 2020 Quarterly Newsletter of the Insolvency and Bankruptcy Board of India, 72.46 per cent of cases that ended in liquidation were previously under SICA or defunct. Furthermore, judicial discretion under Article 14 of the Constitution of India has also played a role in delaying the timely completion of CIRP. The URL to access the report is ibbi.gov.in/uploads/publication/7e9b78bf6eba5254d788c8323055224f.pdf

9. Accruals refer to revenues and expenses that are recorded in the financial statements when they are earned or incurred, regardless of when the actual cash transactions occur. For instance, if a firm delivers a service in December but does not receive payment until January, the revenue from that service would still be recorded in December under the accrual accounting method. Similarly, if the firm incurs an expense in December but does not pay for it until January, the expense would still be recorded in December.

10. We use the Altman Z-score to proxy a firm's financial distress. As per Mackie-Mason (1990), the Altman Z-score is a financial metric designed to predict a firm's bankruptcy risk. The formula for calculating the Z-score is as follows:

$$\text{Z-score} = 3.3*(\text{EBIT}^i_t/\text{Total assets}^i_t) + 1.0*(\text{Sales}^i_t/\text{Total assets}^i_t) + 1.2*(\text{Working capital}^i_t/\text{Total assets}^i_t) + 1.4*(\text{Retained earnings}^i_t/\text{Total assets}^i_t)$$

The definition of financial distress and its computation are also outlined in Table 1 on the description of variables used in this study.

11. In this analysis, it is possible that our regression coefficient reflects the impact of an alternate development that coincided with the introduction of the IBC law in 2016. If such is the case, our results cannot be definitively attributed to the IBC reform. However, previous research on the IBC, such as that by Singh *et al* (2021), suggests that the implementation of the IBC law was the only shock in India in 2016 that was strong enough to affect the accounting policy of firms. Therefore, the application of piecewise linear regression analysis within a fixed effects framework is appropriate for our study.

12. The IBC of 2016 represents a national policy framework. However, this legislation does not establish economically significant thresholds defined in terms of loan value for distinguishing between treatment and control firms, nor does it generate a natural discontinuity within the data set. Consequently, the application of the difference-in-difference (DiD) methodology or the regression discontinuity (RD) design are infeasible (Singh *et al* 2021; Chakraborty *et al* 2024).

13. Note that I do not calculate VIF for IBC variables because IBC_Dummy is a time dummy variable, which takes values only for the post-IBC period but is *a priori* set to 0 for years before the promulgation of the IBC. Thus, including IBC variables in our computation of VIF would produce unnecessary distortions.

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