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Governance in Action: How Board Characteristics Mitigate Cash Flows Classification Shifting? The Moderating Role of Financial Constraints

Abstract

Purpose: We empirically examine the impact of board characteristics (BCs) on a novel form of classification shifting (CS) using cash flows among Indian listed firms. Additionally, we aim to investigate whether the financial constraints influence this nexus.

Methodology: We used a dataset consisting of 1602 firm-year observations from 2013 to 2022 to achieve these objectives. Employing a fixed-effect panel-data regression approach, our findings reveal compelling evidence that Indian firms actively engage in cash flow classification shifting (CS), strategically reallocating cash flow items across different reporting activities.

Findings: This result underscores the need for enhanced governance mechanisms to ensure financial reporting transparency. In terms of BCs, we found that board size, board gender diversity, and board independence are negatively associated with CS, highlighting their effectiveness in curbing activities like CS and improving the financial reporting quality. Furthermore, the findings reveal that financial constraint moderates the association between BCs and CS, as board independence and women directors are ineffective to curb CS, when Indian firms are facing financial constraints; however, board meetings positively impact cash-flow CS. The main results remain robust after employing GMM estimation and an alternative proxy of financial constraint.

Originality: Our study offers significant implications for policymakers and regulators, particularly emphasizing the critical role of female board members and the presence of independent directors in fostering transparent and ethical corporate practices.

Keywords: Classification Shifting; Board Characteristics; Cash Flows; Financial Constraints; Earnings Management; Corporate Governance

JEL: M41, G34

1.0 Introduction

The emergence of corporate governance (CG) played a critical role in developing the landscape for financial reporting, especially in recent times when firms were exposed to financial scandals (Ezeani *et al.*, 2022). Corporate failures resulting from financial instability or scandal adversely impact all stakeholders, including capital markets, investors, regulators, employees, creditors, business partners, auditors, and society (Bansal, 2024b; Konadu *et al.*, 2022). For instance, the recent case of Brightcom financial scam displays major lapses in CG, signifying the urgent need for strict mechanisms to prevent such financial scams (Hasan, 2023). Therefore, it is crucial to implement strong corporate governance processes to guarantee that firms uphold transparency, accountability, and integrity in financial reporting, thereby bolstering investor confidence and ensuring the efficient operation of capital markets (Col & Sen, 2019; Shleifer & Vishny, 1997). Furthermore, Fauver and Fuerst (2006) and Ezeani *et al.* (2022) documented that having an efficient board is one way to strengthen the firm's governance, which prevents financial misreporting and protects shareholder interests.

Financial reporting misconduct is a significant issue in corporate governance and financial integrity. Christensen (2016) and Salem *et al.* (2023) assert that such misconduct includes the misreporting or manipulation of financial statements. This encompasses the employment of 'legitimate' accounting methods that, although seemingly adherent to Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS), are deliberately manipulated to misrepresent the actual financial status or performance of an entity (Jaggi *et al.*, 2022). These approaches leverage these frameworks' flexibility and interpretive latitude to attain certain managerial goals, like earnings management, obscuring financial concerns, or improving market views. As a result, the distinction between ethical adherence and deliberate concealment becomes indistinct, prompting substantial apprehensions over the transparency, dependability, and comparability of financial disclosures.

The existing literature highlights various techniques of earnings misreporting, encompassing accrual-based earnings management (AEM), real earnings management (REM), and classification shifting (CS) (Jones, 1991; McVay, 2006; Roychowdhury & Watts, 2007; Zalata *et al.*, 2022b). AEM and REM have received considerable scholarly focus, yet classification shifting (CS) has frequently been neglected in previous research (Hsu & Liao, 2023; Jackson, 2018; Lai *et al.*, 2018). This gap in the literature underscores the necessity for a more thorough investigation of CS as a unique and under-researched earnings manipulation approach. In this regard, previous studies including Zalata and Roberts (2016) and Zalata *et al.* (2022b) indicated that managers have motives to shift items within the financial statements as a form of CS.

Also, DeFond and Hung (2007) pointed out that investors use cash flow forecasts to make decisions. Hence, managers may use cash-flow CS to meet the forecasted levels of cash flows as Brown et al. (2013) highlighted that cash flow surprise results frequently stimulate beneficial responses in stock prices. Also, Lee (2012) indicated that inter-temporal smoothing is another reason the firm engages in CS. While prior studies have primarily concentrated on CS in income statements, with limited focus on how it's observed in cash flow statements (Fan *et al.*, 2010; Nagar & Sen, 2016; Zalata *et al.*, 2022b). To the best of the authors' knowledge, the Indian stock market remains unexplored in this context. This offers a significant opportunity to investigate whether Indian companies participate in this underexamined kind of CS, illuminating a crucial yet neglected facet of financial reporting.

Prior studies highlighted that it is essential to have effective governance mechanisms in place to restrain managers from engaging in activities like CS and improve the financial reporting quality (Ji et al., , 2020; Lo, Wong, & Firth, 2010). To improve governance frameworks and ensure precise financial disclosures worldwide, many effective governance structures and accounting techniques have been established. Notable instances encompass the Sarbanes-Oxley Act of 2002 in the United States (Cohen et al., 2008), the implementation of International Financial Reporting Standards (IFRS), and the adoption of the Companies Act 2013 in India (Bansal & Bashir, 2023; Meshram & Arora, 2021). These initiatives seek to enhance the governance framework and promote more transparency and reliability in financial reporting. These corporate governance frameworks provide insights into a firm's managerial structure, enhance transparency, and resource allocation, and address key issues such as business ethics and company laws (Gerged, Albitar, & Al-Haddad, 2023).

Following agency theory, the board of directors is essential to corporate governance, with its composition being crucial for effectively supervising management and reducing activities such as CS (Fama, 1980; Poletti-Hughes & Briano-Turrent, 2019). Essential attributes, like board size, gender diversity, and independence, substantially improve the board's ability to mitigate EM. However, previous research investigating the association between board characteristics (BCs) and EM has produced inconsistent and ambiguous findings (Arun et al., 2015; Fan *et al.*, 2019), possibly attributable to differences in institutional contexts. Prior literature has concentrated on economies with robust investor protection systems (Chen et al., 2015; Ferris & Liao, 2019; Komal *et al.*, 2021), while India's governance structure encounters distinct obstacles, such as the sway of predominant shareholders and a disjointed regulatory landscape (Reed, 2002; Saggar & Singh, 2017).

Furthermore, resource dependence theory posits that the BCs, such as diversity, size, and independence, play a key role in improving organisational performance since they provide expertise, networks, and crucial resources, enabling effective oversight and improving the financial reporting quality (Hillman et al., 2009; Liu et al., 2024). Hence, boards with larger size and broader expertise may enable firms to curb opportunistic activities like CS (Usman et. al, 2022). Likewise, diverse boards tend to showcase a higher level of ethical standards and stakeholder engagement, which are important in mitigating earnings manipulation activities like CS (Zalata & Abdelfattah, 2021). Regarding gender diversity, the gender socialization theory contends that women directors exhibit a lower risk tolerance and avoid unethical practices, potentially making them more effective in mitigating earnings manipulation, such as cash-flow CS (Carvajal et al., 2022). Therefore, it would be interesting to examine the impact of BCs such as size and gender on CS.

Moreover, investors in developing countries frequently emphasise immediate profits rather than enduring governance improvements (Barton et al., 2010). This underscores the necessity to investigate the efficacy of BCs in alleviating CS in cash flows among Indian publicly listed companies. Furthermore, financial constraints introduce an additional dimension of complication to this interaction. Previous research indicates that financial constraints convey adverse signals to markets and heighten the likelihood of financial inaccuracies (Gerakos & Syverson, 2015; Lin & Wang, 2023). Companies experiencing financial constraints are more inclined to adopt EM strategies, especially accrual-based EM (Charitou et al., , 2011; Li *et al.*, 2023). Consequently, it is essential to examine whether financial constraints influence the link between BCs and CS, providing a more profound understanding of how governance mechanisms function under different financial strains.

Our paper contributes to the existing literature in several ways. Firstly, prior studies on CS have been conducted in developed economies (Malikov & Gaia, 2022; Malikov, Manson, & Coakley, 2018; Zalata & Roberts, 2016) with limited evidence related to developing nations, particularly India. Therefore, this study used Indian-listed firms to examine the impact of BCs on CS using cash flows. Secondly, most previous studies on CS practices have used income statements, whereas studies on cash-flow CS are limited (Bansal et al., 2021; Usman *et al.*, 2023; Zalata *et al.*, 2022a; Zalata & Roberts, 2017). Hence, we provide new evidence on how Indian firms use CS through cash flows to misrepresent their earnings. This study examines the moderating influence of financial constraints on the link between BCs and CS. Although previous studies have primarily focused on the influence of financial constraints on AEM and REM, CS has been largely overlooked in this regard (Kong et., 2024; Li *et al.*, 2020). By addressing this gap, we present empirical evidence on how financial constraints might affect the

efficacy of BCs in reducing CS, providing significant insights into the relationship between governance systems and financial pressures.

The remaining study is structured as follows: Section 2 discusses the institutional background of the study, and Section 3 reviews the relevant literature on CS, BCs, and financial constraints. Section 4 explains the research methodology adopted, including data collection and analysis techniques employed. Section 5 presents the analysis and discusses its implications. Lastly, section 6 concludes the study, including limitations and suggestions for future research.

2.0 Institutional Background

According to Sarkar and Sarkar (2000), a key feature of emerging economies like India is the prevalent inclination towards insider control and ownership. This tendency exists alongside relatively weaker external regulatory mechanisms, such as underdeveloped capital, takeover markets, and a comparatively ineffective legal framework (Reed, 2002). In India, Chakrabarti et al., (2008) stated that around 60 percent of the 500 largest firms, representing 65 percent of the market capitalisation, are family-owned, and founder-owners hold 53 percent of the shares. Due to substantial ownership stakes and executive positions, previous studies claimed that such concentration of power allows them to advance their agendas at the expense of minority shareholders (Bansal & Bashir, 2023; Chauhan et al., 2016; Narayanaswamy et al., 2012).

Recently, there has been rapid growth in the foreign investment flows in Indian firms, resulting in foreign investors demanding a robust CG structure (Col & Sen, 2019). In terms of CG structure in India, it was initially governed by the Companies Act of 1956. However, the Companies Act of 2013 and "Clause 49" of the stock exchange listing requirements issued by the Securities Exchange Board of India (SEBI) have become the main framework for CG regulations (Balasubramanian et al., 2010; Bansal, 2023; Shette et al., 2016). Also, Clause 49 is like the US Sarbanes-Oxley Act of 2002. Nevertheless, scandals like the Satyam and Bright Financial scams have cast doubt on the governance practices of Indian firms (Hasan, 2023). Also, Narayanaswamy, Raghunandan, and Rama (2012) highlighted that India has been identified as having weak CG and limited investor protection rights. Hence, it would be interesting to examine the impact of board characteristics (BCs), including board size, board meetings, board gender diversity, and board independence, on cash-flow CS.

To improve the global acceptance of Indian firms' annual reports, the Indian Accounting Standards (Ind AS) were aligned with the International Financial Reporting Standards (IFRS) in 2011. The Ministry of Corporate Affairs, Government of India, then formally introduced these standards in a phased approach beginning on April 1st, 2016

(Bansal et al., , 2021). The convergence process from Ind AS to IFRS allows for certain differences in the recognition and presentation of items in the financial statements. As a result, the carve-outs, or distinctions between IFRS and Indian Accounting Standards, may reduce IFRS' effectiveness in restricting managerial discretion (Adhikari, Bansal, & Kumar, 2021). Additionally, Meshram and Arora (2021) pointed out that there is a lack of IFRS specialists in India, which poses a significant challenge for Indian authorities in implementing IFRS. In terms of CS, Nagar and Sen (2016) mentioned that earnings manipulation using cash flows is a low-cost method that doesn't impact future cash flows, making it difficult to detect. Prior literature pointed out that earnings manipulation using tools such as CS is not limited to developed countries but is more likely to be more pronounced in countries with weaker investor protection, less dominant controlling shareholders, and generally an underdeveloped CG system (Behn *et al.*, 2013; Usman *et al.*, 2023). Therefore, it would be interesting to investigate the impact of the ongoing adoption of IFRS on CS practices among Indian firms and whether BCs effectively mitigate earnings manipulations using cash flows or not.

3.0 Literature Review and Hypothesis Development

3.1 Classification Shifting using cash flows.

There has been a significant advancement in classification shifting (CS) literature since 2006. Previous literature mainly focused on other forms of earnings management (EM), including accrual and real earnings management, and ignored CS (Anagnostopoulou *et al.*, 2021; Malikov & Gaia, 2022, Mulchandani et al., 2025). However, McVay (2006) first provided evidence of manipulation of earnings using CS among US firms, where managers shift operating expenses to income-decreasing special items to inflate core earnings (Zalata et al., 2018). Furthermore, Fan *et al.* (2010) used a modified core earnings expectation model and documented evidence of CS. Recently, Malikov et al., (2018) proposed a new approach to CS and focused on revenue from non-operating activities as operating revenues. They found evidence of UK managers inflating operating revenues by manipulating non-operating revenues using CS. Bradshaw and Sloan (2002) pointed out that financial analysts and investors prioritise income statement items based on their placement in the financial statement.

However, Lee (2012) argued that managers could use cash flow statements to manipulate earnings by misclassifying items to inflate cash flows. Additionally, the quality of cash flows is crucial for businesses, as it is a key consideration that influences their ability to raise finance through debt or equity (Ghosh & Moon, 2010). Furthermore, prior studies highlighted that firms may experience a positive reaction in share prices due to unexpected cash flow results, which is why investors pay close attention to firms' cash flow from operations

(Brown et al., 2013; Cohen et al.,2002). Several studies on CS mainly focused on the misclassification of items using income statements and only considered developed countries (Behn *et al.*, 2013; Zalata & Abdelfattah, 2021; Zalata *et al.*, 2022b) and ignored the cash flow form of CS.

In terms of developing markets, Bansal (2023) investigated whether the incentives of credit markets drive CS, indicating that Indian firms tend to misclassify their cash flows to achieve the set performance targets, especially when they are facing pressure to maintain creditworthiness. Bansal and Bashir (2023) examined the influence of Indian firms' business strategy towards CS behaviour and concluded that firms based on aggressive strategies are likely to manipulate their earnings using the CS method. Likewise, Bansal (2024a) found that there is a variation in CS practices across the life cycle of the firms, as younger firms are more prone to CS due to factors including resource constraints and market pressure. Mulchandani et al., (2024) investigated impact of firm's life cycle on cash-flow CS. Hence, these studies focused on firm-level factors like credit markets, firm's life-cycle and business strategy in India, while focusing on CS, our paper shifts attention to BC governance mechanisms to investigate their impact on CS.

Therefore, we examine whether there is evidence of CS among Indian firms with a particular focus on cash flow statements. The frequency of accounting scandals, shown by the Satyam case, highlights the necessity of scrutinising the potential misuse of cash flows to manipulate earnings. Considering this context, we formulate the following hypothesis.

H1: Indian firms are more likely to engage in CS using cash flows.

3.2 Board Characteristics and Classification Shifting

The board of directors is a crucial internal control mechanism, acting as a bridge between shareholders, who provide capital, and managers, who utilise that capital to maximise shareholders' wealth and create value. (Ezeani *et al.*, 2022). Furthermore, the board ensures that the managers adhere to accounting standards when preparing financial reports and safeguard the credibility of financial statements. Prior studies highlighted that such a supervisory function is essential, as opportunistic managerial behaviour, such as CS, can mislead shareholders (Behn *et al.*, 2013; Healy & Wahlen, 1999; Usman et al., 2022). In line with the perspectives of agency theory, the board of directors is central to corporate governance. Its structure is key to its effectiveness in overseeing management and mitigating activities like CS (Fama, 1980; Poletti-Hughes & Briano-Turrent, 2019). Following prior literature, we used various BCs including board size, board meeting, board gender diversity, and board

independence to investigate whether they effectively reduce the extent of earnings manipulation using cash flows among Indian firms (Chen & Dagestani, 2023; Ezeani *et al.*, 2022; Zalata & Roberts, 2016).

According to proponents of agency theory, the size of a board affects how effectively it can perform its duties (Jensen & Meckling, 1976; Usman *et al.*, 2023). Hence, Coles et al., (2008) and Busco *et al.* (2019) pointed out that the optimal board size seems to depend on several factors, including the firm's size and complexity, the industry in which it operates, and the proportion of inside and outside board members. There are pros and cons to both larger and smaller boards. For instance, smaller boards are easier to organise, and directors are likely to know each other well, which facilitates productive discussion and helps establish effective consensus (Cheng, Evans, & Nagarajan, 2008; Jouber & Fakhfakh, 2011). Whereas, small boards have a weaker ability to monitor the management actions, leading to greater discretion over higher compensation, an increased risk of earnings management, and a higher susceptibility to information asymmetry (Brick et al., 2006; Sáenz González & García-Meca, 2014).

In contrast, prior studies documented that larger boards enhance reporting quality and scrutiny as they have more independent directors and diversified experience that enables them to curb activities like CS (Gerged et al., 2023; Sáenz González & García-Meca, 2014; Xie et al., 2003). Thus, a larger board improves the quality of corporate decisions and restrains managers from engaging in activities like CS. However, Guest (2008) and Jensen (1993) argued that an increase in board size may reduce its effectiveness at overseeing management due to communication and coordination challenges. Nevertheless, we expect that larger boards have diverse experience and the ability to tackle issues like CS. Therefore, we propose the following hypothesis:

H2. Board size is significantly associated with CS using cash flows among Indian firms.

Board meeting frequency is a crucial CG mechanism, as Ji, Talavera, and Yin (2020) highlighted that board meetings allow directors to gain more information about the firm through communications and interactions. Also, frequent meetings help strengthen cohesion among directors and raise the level of monitoring (Albitar, 2015; Vafeas & Vlittis, 2024). Prior studies documented that the frequency of board meetings is negatively associated with earnings management, resulting in higher-quality financial reporting (DeBoskey et al.,, 2019; Sáenz González & García-Meca, 2014; Xie et al., 2003). Although these studies offer significant insights, they predominantly concentrate on accrual and real earnings management, overlooking the potential utilisation of CS as a mechanism for earnings manipulation.

Furthermore, Brick and Chidambaran (2010) reported a positive association between the frequency of board meetings and firm value, underscoring the idea that meeting frequency indicates enhanced monitoring rather than increased advisory roles. Whereas, Vafeas (1999) asserted that frequent board meetings may increase firms' financial burdens due to travel expenses and sitting allowances given to board members. In line with the notion of agency theory, we expect that corporate boards that meet frequently have a great ability to advise, monitor, and restrain managers from engaging in activities like CS using cash flows (Ntim et al., 2017). Therefore, we expect the following:

H3. The frequency of Board meetings is significantly associated with CS using cash flows among Indian firms.

The presence of independent directors on the board enables them to protect shareholders' interests by preventing managers from pursuing personal gains (Yekini *et al.*, 2015). According to Beasley and Petroni (2001) and Lu *et al.* (2022), the non-executive board members assess management performance, which enhances vigilance towards agency issues. Consistent with the agency and resource dependence theory perspective, they highlighted that a board's effectiveness as a monitoring entity is contingent upon its independence from management. Furthermore, Beasley (1996) documented that firms with fewer independent directors on their boards are more likely to engage in fraudulent activities like earnings management. Additionally, Clause 49 mandates a stipulated number of independent directors on corporate boards in India. Prior studies found that the presence of independent directors improves the monitoring function of the board and ensures a higher quality of reporting earnings, resulting in increased firm value (Ahmed & Iwasaki, 2021; Peasnell et al.,, 2005; Xie et al., 2003). However, in the Indian context, Sarkar, Sarkar, and Sen (2008) reported that there is no significant association between the board's independence and earnings management. Hence, we expect that a higher proportion of independent directors are more capable of effective monitoring and mitigating activities like CS. Therefore, we propose the following hypothesis:

H4. Board Independence is significantly associated with CS using cash flows among Indian firms.

Gender diversity on corporate boards is increasingly recognised as one of the vital factors that influence board performance (Biswas *et al.*, 2023; Nguyen et al., 2020, Wasan et al., 2025). Consistent with corporate governance literature, Zalata *et al.* (2022b) pointed out that the inclusion of women on boards strengthens board independence and enhances managerial oversight, reducing the likelihood of activities like earnings management. Similarly, Carter et al., (2003) and Ezeani *et al.* (2022) highlighted that female board members contribute to great board efficiency and effectiveness. In line with the notion of gender socialization theory, Liu et al., (2014) and Usman,

Salem, and Ezeani (2022) noted that female board members exhibit a lower tolerance for unethical practices like manipulation of financial earnings, compared to their male counterparts, due to their natural risk aversion behaviour.

Regarding gender diversity on the corporate board, Indian legislators passed legislation in the Companies Act (2013), which came into effect in 2015, mandating all listed public companies to appoint at least one woman director (Mulchandani et al., 2021). The corporate section in India responded favourably to the legislation, with commentators viewing it as a positive step (Terjesen, Aguilera, & Lorenz, 2015). In 2019, adherence to the gender diversity mandate attained 97%, with 24% of enterprises exceeding the requirement (Vohra, 2020). Previous studies found that female directors mitigate earnings manipulation and improve the financial reporting quality (Harris et al., 2019; Zalata *et al.*, 2022b; Zalata et al., 2018). Hence, we expect that the presence of female directors restrains managers from engaging in CS. Therefore, we propose the following:

H5. Board Gender Diversity is significantly associated with CS using cash flows among Indian firms.

The risks associated with financial constraints differ from those of financial distress. Prior studies pointed out that financially constrained firms are more vulnerable as they are restricted by a lack of operational flexibility (Yang et al., 2016; Zhang, 2005). Whereas, Chae et al., (2009) documented that firms that are less financially constrained often raise dividend payments to strengthen their governance mechanisms. Similarly, Koo, Ramalingegowda, and Yu (2017) claimed that a reduction in managers' participation in earnings management can further facilitate higher dividends by alleviating financial constraints. Conversely, prior studies found that financially constrained firms are more prone to engage in EM practices than their unconstrained counterparts (Charitou, Lambertides, & Trigeorgis, 2011; Sánchez-Ballesta & Yagüe, 2021). Furthermore, Linck et al., (2013) and Kong et al., (2022) found that financial constraints are positively associated with AEM practices, suggesting that financial constraints firms facing financial difficulties are likely to engage in EM.

Hence, it could be seen that financial constraints impair the managerial decision-making ability and raise the pressure on firms to misrepresent their financial earnings. While effective BC tends to mitigate manipulation activities like earnings management, it is expected that factors like resource pressure and managerial entrenchment may lower the board's capability to monitor managerial opportunistic behaviour under financial constraints (He & Ren, 2023). However, no study to date has considered CS while examining the impact of financial constraints. Therefore, we expect that financial constraints influence the association between BCs and CS using cash flows. Hence, we formulate the following hypothesis:

H6. Financial constraints moderate the association between BCs and CS using cash flows among Indian firms.

4. Data and methodology

4.1 Research sample selection

To test our hypothesis, we used data from the Bombay Stock Exchange (BSE) index, which represents the top 500 firms in India. The BSE, ranked as the 10th largest stock market worldwide (Economic Times, 2020), offers a rich and diverse dataset that facilitates an extensive investigation of corporate governance practices across all sectors. This method ensures that our results are contextually pertinent and generally comparable. Financial data is extracted from CMIE Prowess, and board and audit characteristics data are taken from Bloomberg Professional Services. For macroeconomic variables, OECD data library (BCI), World Bank (EPU data), and RBI website (inflation data) are referred. The current study examines 10 years spanning from 2013 to 2022. The year 2013 was selected as the starting point due to the substantial changes to the Companies Act in India that were implemented that year, while 2022 represents the most recent year for which data was accessible throughout the gathering period (Gatti *et al.*, 2019). The exclusion of financial institutions from this study is justified because of their distinct regulatory and capital structures, which markedly diverge from those of non-financial industries. The disparities arise from more stringent regulatory mandates, unique cash flow accounting methodologies, and specialised frameworks for assessing social responsibility, which differentiate them in performance and reporting procedures (Bilal *et al.*, 2022; Gatti *et al.*, 2019). Outliers from the sample data are also removed for empirical analysis. Furthermore, due to missing data and companies established after 2013, our final sample consists of 1602 firm-year observations.

4.2. Measurement of Variables

4.2.1 Classification Shifting

To measure classification shifting (CS) using cash flows, we adopted the approach of Roychowdhury (2006) and Lee (2012) to measure unexpected cash flow from operating activities (UE_CFO). The model used in this study expresses cash flow from operations as a linear function of sales and change in sales in the current period, as shown in Equation 1 (Kim & Sohn, 2013). Unexpected cash flow from operating activities (UE_CFO) is calculated using Equation 1 and taking the difference between actual and predicted CFO. The definitions of the variables used in Equation 1 are provided in Appendix 1.

$$\frac{CFO_{i,t}}{AT_{i,t-1}} = \alpha_0 + a_1\left(\frac{1}{AT_{i,t-1}}\right) + a_2\left(\frac{Sales_{i,t}}{AT_{i,t-1}}\right) + a_3\left(\frac{\Delta Sales_{i,t}}{AT_{i,t-1}}\right) + e_{i,t} \qquad \text{(Equation 1)}$$

To test our hypothesis 1, we used Equation 2 to determine whether Indian firms engage in cash-flow misclassification (CFM). The variables are defined in Annexure I.

$$UE\_CFO_{i,t} = \beta_o + \beta_1 CFF_{i,t} + \beta_2 CFI_{i,t} + e_{i,t} \quad \text{(Equation 2)}$$

If the firm engages in CS using cash flows, we expect a negative coefficient of CFF and CFI. Hence, a negative significant coefficient of CFF and CFI implies that firms indulge in cash-flow management (Nagar & Sen, 2016). Similar to McVay (2006), we investigate the impact of managerial reclassification of cash flows. Therefore, for the main analysis, we have separated the cash inflows and outflows of investing and financing activities to examine whether managers reclassify cash outflows or inflows of investing/financing activities. The CS evidence would indicate a positive association between UE_CFO and investing/financing outflows and a negative relationship with investing/financing inflows. To investigate the effect of BC on UE_CFO, interaction variables of BCs and cash-flows are considered (Refer to Annexure I).

4.2.2 Board Characteristics

Following prior studies, this paper includes several board characteristics (BCs) including board size, meetings, independence and gender diversity (Ezeani *et al.*, 2023; Zalata & Roberts, 2016).

Hence, we used Equation 3 to examine the association between BCs and CS using cash flows:

$$UE\_CFO_{i,t} = \beta_o + \beta_1 CIF_{i,t} + \beta_2 CII_{i,t} + \beta_3 COF_{i,t} + \beta_4 COI_{i,t} + \beta_5 BC_{i,t} + \beta_6 BC * CIF_{i,t} + \beta_7 BC * CII_{i,t} + \beta_8 BC * COF_{i,t} + \beta_9 BC * COI_{i,t} + \beta_{10} ROA_{i,t} + \beta_{11} SIZE_{i,t} + \beta_{12} MTB_{i,t} + \beta_{13} PROD_{i,t} + \beta_{14} DISC_{i,t} + \beta_{15} ACS_{i,t} + \beta_{16} ACM_{i,t} + e_{i,t}$$

(Equation 3)

4.3 Macroeconomics and Control Variables

We have included several macro-economic variables including the Economic policy uncertainty index, Inflation rate, and Business confidence index as previous studies found that they have an impact on the EM practices of the firm and could influence manager's opportunistic behaviour (Cui *et al.*, 2021; Kim & Yasuda, 2021; Yung & Root, 2019). The lagged values of macroeconomic variables are applied in Equation 4 so that the impact of one could be determined by controlling another variable.

$$UE\_CFO_{i,t} = \beta_o + \beta_1 CIF_{i,t} + \beta_2 CII_{i,t} + \beta_3 COF_{i,t} + \beta_4 COI_{i,t} + \beta_5 BC_{i,t} + \beta_6 BC * CIF_{i,t} + \beta_7 BC * CII_{i,t} + \beta_8 BC * COF_{i,t} + \beta_9 BC * COI_{i,t} + \beta_{10} EPU_{i,t} + \beta_{11} INF_{i,t} + \beta_{12} BCI_{i,t} + \beta_{13} ROA_{i,t} + \beta_{14} SIZE_{i,t} + \beta_{15} MTB_{i,t} + \beta_{16} PROD_{i,t} + \beta_{17} DISC_{i,t} + \beta_{18} ACS_{i,t} + \beta_{19} ACM_{i,t} + e_{i,t}$$

(Equation 4)

In addition to macroeconomic variables, our paper includes firm-specific variables such as return on assets (ROA), firm size (SIZE), market-to-book value (MTB), abnormal production cost (PROD), and abnormal discretionary costs (DISC) that may impact CS practices (Roychowdhury, 2006; Zalata *et al.*, 2022b; Zalata *et al.*, 2019). The measurement of PROD and DISC is provided in Annexure II. Furthermore, audit committee variables, including audit committee size and audit committee meetings, are added as control variables in Equation 4, as prior studies documented that large audit committees and frequent audit committee meetings discourage EM practices (Hsu & Liao, 2023; Xie et al., 2003).

4.4 Moderating Variable

Our paper examines the moderating role of financial constraints to investigate whether it impacts the association between CS using cashflows and BCs or not. Following Kaplan and Zingales (1997) and Lamont, Polk, and Saaá-Requejo (2001), we used the proxy of the KZ (Kaplan and Zingales) Index to measure financial constraints in a firm, as this model considers both qualitative and quantitative factors to determine whether the firm is financially constrained. Equation 5 is used to determine the KZ Index for all firm-year observations:

$$KZ_{it} = -\left(1.002\frac{CF}{K_{t-1}}\right)it + (0.283Q)it + \left(2.139 * \frac{D}{Total\ Cap}\right)it - \left(39.368 * \frac{Div}{K_{t-1}}\right)it - \left(1.31 * \frac{Cash}{K_{t-1)}}\right)i$$

(Equation 5)

The KZ index is considered one of the prominent measures of financial constraints. This index uses 5 accounting variables and assigns a positive load to leverage and MTB ratio, whereas negative weights are assigned to cash flow, dividends, and cash. The higher value of the KZ indicates that a firm is more financially constrained and facing higher financial stress (Li *et al.*, 2023). We use equations 5 and 6 to test hypothesis 6. Equation 6 controls for the macroeconomic variables.

$$UE\_CFO_{i,t} = \beta_o + \beta_1 CIF_{i,t} + \beta_2 CII_{i,t} + \beta_3 COF_{i,t} + \beta_4 COI_{i,t} + \beta_5 BC_{i,t} + \beta_6 KZ_{i,t} + \beta_7 BC * KZ * CIF_{i,t} + \beta_8 BC * KZ * CII_{i,t} + \beta_9 BC * KZ * COF_{i,t} + \beta_{10} BC * KZ * COI_{i,t} + \beta_{11} ROA_{i,t} + \beta_{12} SIZE_{i,t} + \beta_{13} MTB_{i,t} + \beta_{14} PROD_{i,t} + \beta_{15} DISC_{i,t} + \beta_{16} ACS_{i,t} + \beta_{17} ACM_{i,t} + e_{i,t}$$

(Equation 6)

$$UE\_CFO_{i,t} = \beta_o + \beta_1 CIF_{i,t} + \beta_2 CII_{i,t} + \beta_3 COF_{i,t} + \beta_4 COI_{i,t} + \beta_5 BC_{i,t} + \beta_6 KZ_{i,t} + \beta_7 BC * KZ * CIF_{i,t} + \beta_8 BC * KZ * CII_{i,t} + \beta_9 BC * KZ * COF_{i,t} + \beta_{10} BC * KZ * COI_{i,t} + \beta_{11} EPU_{i,t} + \beta_{12} INF_{i,t} + \beta_{13} BCI_{i,t} + ROA_{i,t} + \beta_{15} SIZE_{i,t} + \beta_{16} MTB_{i,t} + \beta_{17} PROD_{i,t} + \beta_{18} DISC_{i,t} + \beta_{19} ACS_{i,t} + \beta_{20} ACM_{i,t} + e_{i,t}$$

(Equation 7)

Considering the nature of the study, we had to choose between random-effects and fixed-effects (FE) panel regression for estimating our models. To make the selection, we used the Haussmann Test, and the results rejected the null hypothesis, confirming random-effect panel regression to be employed. Therefore, the fixed-effect panel data regression model is employed. The FE model controls for all heterogeneity among the units (Rüttenauer & Ludwig 2023). In the FE model, the intercept may differ across units, but it doesn't change over time (Khalil et al., 2024).

5. Results

5.1 Descriptive Statistics

Table I presents the descriptive statistics of the study variables. In line with Nagar and Sen (2016), the mean value of UECFO is 0.001, which is expected as it represents the residual of the model. Also, it suggests that UECFO is a reliable metric for assessing the quality of report cash flows. The negative values of CFF and CII indicate that sample firms experience greater outflows in financing and investing activities compared to inflow. Among the sample firms, 54 percent (approx.) of the directors are independent, however, the percentage of women directors is only 12 percent. The directors meet 6 times (approx.) in a year, which is more than the mandatory board meetings of 4 as per the Companies Act (2013). The mean value of the KZ index is 10.4 with a standard deviation of 53.4 implying that a lot of variations exist among the firms regarding financial constraints. A higher value of the KZ index implies a higher level of financial constraints faced by the firm (Farooq *et al.*, 2022). Contrastly, Alrashidi et al., (2021) reported a KZ Index of -0.45 for Indian firms from 2002 to 2017, implying that financial constraints have increased among the firms lately.

Table I: Descriptive Statistics

Variables		Mean	Median	Standard Deviation	Minimum	Maximum
CS Cash-flow Variables	UECFO	-0.001	-0.004	0.061	-0.137	0.146
	CFF	-0.044	-0.042	0.105	-0.849	0.919
	CFI	-0.061	-0.049	0.096	-1.247	0.428
	CIF	0.079	0.036	0.174	-0.822	1.622
	CII	0.258	0.040	0.518	-0.045	4.641
	COF	-0.123	-0.083	0.144	-1.506	0.000
	COI	-0.321	-0.118	0.523	-4.682	0.000
Board Characteristics	LN(BS)	2.248	2.303	0.258	0.693	2.996
	BM	6.179	6.000	2.296	2.000	25.000
	WB	12.413	11.111	8.785	0.000	54.546
	ID	54.684	50.000	16.380	7.692	200.000
Financial Constrains	KZ Index	10.426	3.828	53.478	-283.286	1816.953

Macro-economic Variables	EPU	89.328	76.101	32.056	56.534	170.791
	INF	5.593	5.131	1.876	3.328	10.018
	BCI	97.814	97.775	1.302	94.432	99.378
Control Variables	ROA	7.779	6.790	6.948	-25.330	78.320
	SIZE	11.110	10.906	1.376	7.186	15.223
	MTB	4.89	3.275	5.565	0.210	68.890
	PROD	-0.009	0.011	0.201	-1.959	0.962
	DISC	0.002	-0.015	0.068	-0.203	0.641
	ACS	3.941	4.000	0.892	1.000	8.000
	ACM	5.504	5.000	2.075	2.000	21.000

The study variables are defined in Annexure I.

5.2 Correlation Matrix

In terms of correlation, Gujarati (2021) pointed out that the Pearson coefficients must not exceed 80 percent to avoid the issue of multicollinearity. Gujarati (2009) highlighted that Pearson coefficients must not be more than 80% to avoid the issue of multicollinearity. Table II depicts that none of the independent variables are highly correlated with each other, which eliminates the chances of multicollinearity problems. The highest correlation reported was 0.56 between ACM and BM. We find a significant positive correlation between UECFO and board size, UECFO and WB; however, UECFO and ID are significantly negatively related. Among the control variables, UECFO has a significant positive correlation with ROA, MTB, and DISC.

Table II: Correlation Matrix

Variables		Cash-flow Variables							Board Characteristics				Financial Constrains	Macro-economic Variables			Control variables					
		UECFO	CFF	CFI	CIF	CII	COF	COI	LN(BS)	BM	WB	ID	KZ Index	EPU	INF	BCI	ROA	SIZE	MTB	PROD	DISC	ACS
Cash-flow Variables	UECFO	1.00																				
	CFF	-0.20**	1.00																			
	CFI	-0.24**	-0.14**	1.00																		
	CIF	-0.03	0.56**	-0.08**	1.00																	
	CII	0.10**	-0.14**	0.05*	-0.05*	1.00																
	COF	-0.11**	0.05*	-0.00	-0.79**	-0.04	1.00															
	COI	-0.14**	0.11**	0.11**	0.04	-0.98**	0.04	1.00														
Board Characteristics	LN(BS)	0.07**	-0.01	-0.04	0.02	-0.02	-0.04	0.01	1.00													
	BM	-0.05*	0.03	-0.03	-0.01	0.00	0.03	-0.01	0.05	1.00												
	WB	0.06*	-0.01	0.03	-0.02	-0.01	0.02	0.02	-0.15**	0.02	1.00											
	ID	-0.03	-0.03	0.03	0.00	0.04	-0.03	-0.04	-0.12**	-0.07**	0.18**	1.00										
Financial Constrains	KZ Index	0.03	-0.06**	0.09**	0.07**	0.09**	-0.14**	-0.08**	-0.01	-0.02	-0.01	-0.01	1.00									
Macro-economic Variables	EPU	-0.04	0.01	-0.07**	0.02	-0.01	-0.02	0.00	0.01	-0.08**	-0.34**	-0.10**	0.00	1.00								
	INF	-0.05*	-0.01	-0.04	0.01	-0.01	-0.02	0.01	-0.01	-0.05*	-0.20**	0.11**	0.00	0.81**	1.00							
	BCI	-0.05*	-0.04	-0.06**	-0.03	0.02	0.01	-0.03	0.04	0.00	-0.14**	-0.01	-0.01	0.01	-0.26**	1.00						
Control variables	ROA	0.48**	-0.26**	-0.13**	-0.01**	0.21**	0.01	-0.23**	-0.01	-0.14**	0.00	0.09**	0.14**	-0.01	0.01	0.05*	1.00					
	SIZE	0.03	-0.01	0.06*	0.03	0.04	-0.04	-0.03	0.26**	.045**	0.08**	-0.01	-0.06**	-0.12**	-0.06*	-0.05*	-0.21**	1.00				
	MTB	0.15**	-0.19**	0.00	0.03	0.10**	-0.18**	-0.10**	-0.06*	-0.10**	0.06**	0.04	0.11**	-0.10**	-0.08**	0.07**	0.37**	-0.27**	1.00			
	PROD	-0.04	-0.09**	-0.07**	-0.01	0.01	-0.05*	-0.02	-0.03	0.02	-0.13**	-0.04	-0.07**	0.08**	0.05*	0.05*	0.24**	-0.14**	0.28**	1.00		

	DISC	0.12**	-0.13**	-0.09**	-0.03	-.05*	-0.06**	0.04	-0.01	-0.12**	-0.04	0.08**	0.04	0.05	0.04*	0.03	0.31**	-0.26**	0.40**	0.34**	1.00	
	ACS	0.03	-0.01	-0.01	0.05	-0.04	-0.06**	0.04	0.27**	-0.03	0.03	0.04	0.03	-0.04	-0.03	0.02	0.09**	0.00	0.08**	-0.02	0.13**	1.00
	ACM	-0.05	-0.04	0.05*	-0.01	0.14**	-0.02	-0.12**	0.10**	0.56**	0.03	0.03	0.01	-0.05*	-0.03	-0.02	-0.12**	0.44**	-0.06**	0.01	-0.11**	-0.05*

***,**,* represents statistical significance at 1%, 5%, and 10% levels

5.3 Results and Discussion

5.3.1 Classification Shifting

To test hypothesis 1, we used Equation 2 and found that both CFF and CFI are negatively and significantly associated with UE_CFO, confirming the presence of CS using cash flows (Table III). The result confirms that managers of Indian firms used this method of CS to misreport their earnings and shift the cash-flow items from one activity to other (Nagar & Sen, 2016). Other studies such as Zalata and Abdelfattah (2021) and Malikov and Gaia (2022) focused mainly on income statement items while investigating CS, and ignored cash flows. Hence, our findings highlight the importance of examining cash flow items, as they are used by managers to misreport earnings. Furthermore, this emphasises the need to assess the effectiveness of BCs in curbing such forms of earnings manipulation.

Table III: Cash-flow CS among sample firms

Variables	**Co-efficient (t-value)**
CFF	-0.142*** (-10.311)
CFI	-0.180*** (-11.926)
Constant	-0.018*** (-9.767)
R-squared	0.119

***, **, * represents statistical significance at 1%, 5%, and 10% levels

5.3.2 Main Results

Table IV reports the impact of the BCs on the cash flows of CS among Indian listed firms. In line with prior literature, we have used the interaction variables between cash-flow items (CIF, COF, CII, COI) and BC (board size, board meetings, board gender diversity, board independence) (Malikov, Manson, & Coakley, 2018; McVay, 2006; Zalata *et al.*, 2022b). Columns (2, 4, 6, 8) of Table IV report the regression results of Equation 3, and Columns (3, 5, 7, 9) represent the regression results of Equation 4, which control for the macroeconomic variables. In terms of board size, the interaction terms CII*LN(BS) and COI*LN(BS) are negatively significantly associated with UE_CFO, confirming that large boards restrain managers from engaging in investing activities of cash inflow/outflow items (Zalata & Roberts, 2016). In line with the notion of resource dependence theory, our results confirm that a larger board size enhances financial reporting quality due to its diverse expertise and experience

that leads to effective and synergetic (Cheng, 2008; Xie, Davidson III, & DaDalt, 2003). However, the interaction variables [CIF*LN(BS), COF*LN(BS)] of board size and cash flows from financing activities are insignificantly associated with UE_CFO. Similar results were reported when we added macroeconomic variables (Column 3).

Constrastly, the interaction variables (CII*BM, COI*BM) of board meetings and cash flows from investing activities are positively significantly associated with UE_CFO, highlighting that board meetings are ineffective in restraining earnings manipulation (Zalata & Roberts, 2016). Regarding board meetings and cash flows from financing, the interaction variables (CIF*BM, COF*BM) are negatively and significantly related to UE_CFO (Table IV). In line with the proponents of agency theory, it indicates that frequent board improves overall monitoring and prevents activities like CS (Vafeas & Vlittis, 2024; Xie et al.,, 2003). Hence, our results indicate that the effectiveness of BCs may differ for cash flow activities.

Similarly, we found that board gender diversity is negatively and significantly associated with UE_CFO among all the interaction variables, confirming that the presence of females in the board committees mitigates cash-flow CS (Arun et al., 2015; Usman et al., 2022). Our result supports gender socialization theory as it indicates that women on board display lower tolerance for unethical practices like manipulation of financial earnings, compared to their male counterparts due to their natural risk aversion behaviour (Zalata *et al.*, 2019). Overall, our results are in line with the notion that BCs promote transparency and enhance financial reporting quality.

We used board independence as the fourth variable of BCs. Table IV shows that the interaction variables of both investing and financing activities (cash inflows/outflows) are negatively and significantly related to UE_CFO. Hence, our results confirm that independent board members are protecting shareholders' interests by preventing practices of cash-flow CS (Zalata & Abdelfattah, 2021). The findings are consistent with the perspectives of agency theory as it indicate that board independence is one of the key BCs to enhance the effectiveness of the board and improve the financial reporting quality (Beasley, 1996; Usman, Salem, & Ezeani, 2022).

In terms of macroeconomic variables, we found that Inflation (INF) and Business Confidence Index (BCI) are significantly negatively related to UE_CFO. Similar to Cui *et al.* (2021) and Yung and Root (2019), Economic Policy Uncertainty (EPU) displays a significant positive coefficient, showing that Indians engage more in UE_CFO when the EPU exposure is high. Regarding firm-specific variables, we found that firm size is negatively associated with UE_CFO, indicating that large Indian firms are unlikely to engage in cash-flow CS (Zalata & Roberts, 2016). Whereas, ROA is positively related to UE_CFO, indicating that high-performing firms are likely to misreport earnings using CS (Zalata & Roberts, 2017). The negative relationship between real earnings

management (REM) and cash-flow classification shifting (CS) suggests that firms use these methods as substitutes because both serve the purpose of achieving earnings management goals, but operate through different mechanisms. Managers may prioritize one method of earnings management over the other based on cost, risk, or circumstances (Abernathy et al., s2014). Hence, managers use CS as a substitute form of EM for both AEM and REM. The negative impact of ACS on cash-flow CS suggests that a larger audit committee size can constrain cash-flow CS. A larger committee size possesses diverse skills and knowledge, which enables the committee to be more efficient (Salem et al., 2021).

Table IV: Impact of board characteristics on cash-flow CS

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
Variable	Control for firm level variables	Control for firm level and macro-economic variables	Control for firm level variables	Control for firm level and macro-economic variables	Control for firm level variables	Control for firm level and macro-economic variables	Control for firm level variables	Control for firm level and macro-economic variables
	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)
CIF	0.015 (0.15)	0.015 (0.15)	0.049 (1.19)	0.034 (0.402)	-0.024** (-2.01)	-0.028** (-2.32)	-0.032*** (-2.67)	-0.034*** (-2.92)
CII	0.094 (0.89)	0.094 (0.89)	-0.174*** (-6.63)	-0.173*** (6.69)	-0.135*** (-6.22)	-0.129 (-6.51)	-0.124*** (-5.42)	-0.126*** (-5.53)
COF	0.034 (0.26)	0.034 (0.26)	0.088* (1.68)	0.062 (0.231)	-0.041** (-1.97)	-0.048** (-2.39)	-0.076*** (-3.69)	-0.074*** (-3.64)
COI	0.117 (1.02)	0.117 (1.14)	-0.164*** (-6.56)	-0.164*** (-6.62)	-0.137*** (-6.45)	-0.142*** (-6.74)	-0.131*** (-5.87)	-0.132*** (5.97)
LN(BS)	-0.015 (-1.41)	-0.015 (1.41)						
BM			-0.003*** (-2.64)	-0.003** (2.27)				
WB					-0.001*** (-3.02)	-0.008*** (-2.90)		
ID							-0.001*** (-7.54)	-0.001*** (-5.00)
CIF*LN(BS)	-0.014 (-0.30)	-0.015 (-0.34)						
CII*LN(BS)	-0.104** (-2.10)	-0.092* (-1.91)						
COF*LN(BS)	-0.043 (-0.70)	-0.050 (-0.83)						

COI*LN(BS)	-0.109* (-2.30)	-0.101** (-2.17)						
CIF*BM			-0.011* (-1.68)	-0.009 (-1.41)				
CII*BM			0.007** (2.08)	0.006** (2.08)				
COF*BM			-0.024*** (-2.96)	-0.020** (-2.50)				
COI*BM			0.006** (2.22)	0.006** (2.22)				
CIF*WB					-0.021*** (-16.25)	-0.021*** (-16.19)		
CII*WB					-0.012*** (-7.98)	-0.0134*** (-7.67)		
COF*WB					-0.022*** (-12.68)	-0.020*** (-12.18)		
COI*WB					-0.013*** (-7.56)	-0.012*** (-7.27)		
CIF*ID							-0.007*** (-17.51)	-0.006*** (-5.97)
CII*ID							-0.004*** (-8.62)	-0.004*** (8.60)
COF*ID							-0.131*** (-5.87)	-0.006*** (-17.62)
COI*ID							-0.004*** (-8.29)	-0.004*** (-8.30)
ROA	0.003*** (9.38)	0.003*** (9.95)	0.003*** (9.65)	0.003*** (10.15)	0.002*** (6.21)	0.002*** (6.99)	0.002 (5.89)	0.002*** (6.31)
SIZE	-0.013** (-2.37)	-0.011** (-2.04)	-0.013** (-2.14)	-0.011** (-2.12)	-0.006 (-1.28)	-0.004 (-0.89)	-0.007 (-1.48)	-0.005 (-1.15)
MTB	0.008* (2.27)	0.001** (2.47)	0.001** (2.02)	0.001** (2.23)	0.001*** (2.72)	0.001*** (3.01)	0.001** (2.03)	0.001** (2.42)
PROD	-0.031*** (-4.42)	-0.0267*** (-3.86)	-0.032*** (-4.52)	-0.028*** (-3.95)	-0.025*** (-3.88)	-0.021*** (-3.31)	-0.0215*** (-3.40)	-0.019*** (-3.12)
DISC	-0.089** (-2.38)	-0.081** (-2.17)	-0.092** (-2.44)	-0.083** (-2.22)	-0.102*** (-2.93)	-0.094*** (2.73)	-0.106*** (-3.12)	-0.106*** (-3.14)

EPU		0.001*** (4.37)		0.001*** (4.18)		0.001*** (4.32)		0.001*** (4.38)
INF		-0.008*** (6.08)		-0.008*** (-5.92)		-0.007*** (-5.69)		-0.006*** (-4.57)
BCI		-0.005*** (-5.32)		-0.005*** (5.11)		-0.005*** (-5.30)		-0.004*** (-4.43)
ACS	-0.004* (-1.81)	-0.004* (-1.73)	-0.004** (-2.20)	-0.004** (-2.04)	-0.004* (-1.88)	-0.003* (-1.68)	-0.004** (-2.07)	-0.004** (-1.99)
ACM	-0.000 (-0.36)	-0.001 (-0.39)	0.006 (0.59)	0.000 (0.49)	0.000 (0.13)	0.000 (0.09)	0.001 (0.73)	0.001 (0.47)
Constant	-4.400*** (-3.55)	-4.786*** (-2.95)	-4.692*** (-3.84)	-4.932*** (-3.07)	-1.600 (1.30)	-2.216 (-1.44)	-2.547** (-2.21)	-3.223** (-2.18)
Year	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Adjusted R-Square	**0.160**	**0.201**	**0.151**	**0.189**	**0.380**	**0.415**	**0.399**	**0.426**

***,**,* represents statistical significance at 1%, 5%, and 10% levels

5.3.3 Financial Constraints

Table V displays the results for the moderating effect of financial constraints (KZ) on the association between BCs and cash-flow CS. Hence, our result indicates that the interaction variables [CII*LN(BS)* KZ, COI*LN(BS)*KZ] are positively related to UE_CFO, indicating that financial constraints increase the misstatement risk of investing activities' cash flow items (inflow/outflow) and impact the effectiveness of board size. Similarly, we found that the interaction variables, including KZ, ID, WB, CII, CIF, COI, and COF, are positively associated with UE_CFO as shown in Table V. The results pointed out that board independence and women directors are ineffective BCs when Indian firms are facing financial constraints.

These findings are in line with the notion that governance mechanisms tend not to be efficient when the resources are strained. Hence, BCs are not always effective in financially constrained Indian firms because of time pressure and reduced influence (Ammari & Chebbi, 2025). There is a possibility that female directors are underrepresented and may lack institutional power, whereas independent directors are dependent on management for information. Hence, our results suggest that financial constraints may limit the effectiveness of BCs. Furthermore, it indicates that Indian firms engaging in CS using cash flows as financial constraints is a negative sign for the market since it will raise issues related to financing costs and fewer investment opportunities (Farrell et al., 2014; Xia *et al.*, 2023). Regarding board meetings (BM), KZ negatively moderates the association of BM and cash-flow CS. The model, including macroeconomic variables, reported similar results. Unlike the main results, this confirms that KZ is an important factor and could influence the relationship between BCs and cash flows CS.

Insert Figure 1 about here

In addition, we have provided Figure 1 to present the marginal effect plots including KZ Index (financial constraint proxy), UECFO, and BCs. The graphs indicate that Indian firms manipulate their financial earnings using cash-flow CS when a firm is facing financial constraints, despite having a large board size, frequent board meetings, and an increased number of female and independent directors.

Table V: Moderating role of financial constraints on cash-flow CS

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
Variable	**Control for firm level variables**	**Control for firm level and macro-economic variables**	**Control for firm level variables**	**Control for firm level and macro-economic variables**	**Control for firm level variables**	**Control for firm level and macro-economic variables**	**Control for firm level variables**	**Control for firm level and macro-economic variables**
	Co-efficient (t-value)	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**
CIF	-0.489*** (-25.36)	-0.481*** (-25.15)	-0.487*** (-25.40)	-0.479*** (-25.19)	-0.504*** (-26.05)	-0.496*** (-25.95)	-.507*** (-26.36)	-.503*** (-26.31)
CII	-0.475*** (-25.31)	-0.468*** (-25.17)	-0.470*** (-25.38)	-0.463*** (-25.23)	-0.482 (-25.91)	-0.475*** (-25.78)	-.477*** (-25.62)	-.474*** (-25.60)
COF	-0.489*** (-24.64)	-0.480*** (-24.45)	-0.486*** (-24.53)	-0.477*** (-24.33)	-0.509*** (-25.02)	-0.501*** (-24.91)	-.514*** (-25.45)	-.509*** (-25.36)
COI	-0.474*** (-25.36)	-0.467*** (-25.25)	-0.469 (-25.41)	-0.462*** (-25.28)	-0.480*** (-25.98)	-0.473*** (-25.86)	-.475*** (-25.61)	-.472*** (-25.62)
KZ	-0.001** (-2.26)	-0.001** (-2.05)	-0.001*** (-4.21)	-0.001*** (-3.96)	-0.001*** (-8.58)	-0.001*** (-8.54)	-.001*** (-8.78)	-.001*** (-8.76)
LN(BS)	-0.0142** (-1.99)	-0.013* (-1.83)						
BM			-0.001 (-0.94)	-0.001 (-0.71)				
WB					0.001** (2.00)	0.001* (1.88)		
ID							-.001*** (-4.95)	-.001*** (-2.78)
CIF*LN(BS)* KZ	-0.000 (-0.19)	-0.000 (-0.23)						
CII*LN(BS)* KZ	0.001** (2.17)	0.001** (2.03)						
COF*LN(BS)* KZ	0.000 (0.10)	0.000 (0.27)						
COI*LN(BS)*KZ	0.001** (2.11)	0.001** (2.03)						
CIF*BM*KZ			0.000 (0.07)	-0.000 (-0.08)				

CII*BM*KZ			0.001 (1.03)	0.000 (0.90)				
COF*BM*KZ			-0.001* (-1.95)	-0.000* (-1.75)				
COI*BM*KZ			0.000 (0.94)	0.000 (0.83)				
CIF*WB*KZ					0.0001*** (2.64)	0.0001*** (2.66)		
CII*WB*KZ					0.0001*** (2.93)	0.0001*** (2.67)		
COF*WB*KZ					0.0001*** (4.88)	0.0001*** (5.01)		
COI*WB*KZ					0.0001*** (2.85)	0.0001** (2.59)		
CIF*ID*KZ							.001** (2.23)	.001** (2.36)
CII*ID*KZ							.001** (1.80)	.001* (1.69)
COF*ID*KZ							.001*** (5.69)	.001*** (5.69)
COI*ID*KZ							.0001* (1.65)	.001 (1.54)
ROA	0.001*** (4.70)	0.001*** (5.25)	0.001*** (4.79)	0.001*** (5.32)	0.001*** (4.71)	0.001*** (5.29)	.001*** (4.92)	.001*** (5.33)
SIZE	0.005 (1.22)	0.007 (1.63)	0.004 (0.99)	0.006 (1.43)	0.004 (0.94)	0.006 (1.38)	.005 (1.23)	.006 (1.57)
MTB	0.001*** (3.52)	0.001*** (3.92)	0.001*** (3.29)	0.001 (3.74)	0.001*** (3.68)	0.001*** (4.09)	.001*** (3.91)	.001*** (4.33)
PROD	-0.029*** (-5.13)	-0.026*** (-4.59)	-0.032*** (-5.41)	-0.028*** (-4.85)	-0.029*** (-5.13)	-0.026*** (-4.60)	-.026*** (-4.69)	-.025*** (-4.43)
DISC	-0.097*** (-3.10)	-0.094*** (-3.04)	-0.093*** (-2.96)	-0.090 (-2.92)	-0.106*** (-3.43)	-0.102*** (3.33)	-.096*** (.002)	-.097*** (-3.18)
EPU		0.001*** (4.30)		0.000*** (4.19)		0.001*** (4.64)		.001*** (3.77)
INF		-0.006*** (-5.18)		-0.005*** (-5.08)		-0.006*** (-5.36)		-.004*** (-3.89)
BCI		-0.004*** (-5.30)		-0.004*** (-5.35)		-0.004*** (-5.21)		-.003*** (-4.30)
ACS	-0.002 (-0.98)	-0.002 (-0.88)	-0.003* (-1.65)	-0.002 (-1.48)	-0.003* (-1.75)	-0.003 (-1.57)	-.002 (-1.42)	-.002 (-1.34)
ACM	-0.000 (-0.09)	-0.000 (0.09)	0.000 (0.31)	0.000 (0.22)	-0.000 (-0.01)	-0.000 (-0.02)	.001 (.52)	.001 (.30)
Constant	-0.418 (-0.41)	-0.983 (-0.73)	-0.878 (-0.86)	-1.286 (0.96)	-0.255 (-0.23)	-1.169 (-0.85)	-2.062** (-2.02)	-2.445* (-1.83)
Year	Yes	Year	Yes	Year	Yes	Yes	Yes	Yes
Adjusted R-Square	0.546	0.5541	0.549	0.558	0.546	0.555	.550	.556

***,**,* represents statistical significance at 1%, 5%, and 10% lev

6. Robustness Tests

For conducting a robustness test, the difference generalised method of moments (GMM) is used. The GMM model provides a technique to deal with dynamic panel data, and controls for the endogeneity problem by including the lagged value of the dependent variable as an explanatory variable in the model (Arellano & Bond, 1991). Difference GMM provides coefficients that are compressive and consistent, without the need to address temporal dependence and heteroscedasticity (Hussain et al., 2023)

Table VI: GMM output to assess the impact of board characteristics on cash-flow CS

Column 1	Column 2	Column 3	Column 4	Column 5
Variable	**Control for firm-level variables**	**Control for firm-level variables**	**Control for firm-level variables**	**Control for firm-level variables**
	Co-efficient (t-value)	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**
UECFO (L1)	0.059* (1.70)	0.067* (1.91)	0.078** (2.11)	0.069* (1.96)
CIF	0.775*** (3.51)	-0.115* (-1.85)	-0.292*** (-6.58)	-0.370*** (-7.64)
CII	0.841*** (3.91)	-0.069 (1.04)	-0.258*** (-6.00)	-0.315*** (-6.82)
COF	1.160*** (5.30)	-0.007 (-0.10)	-0.249*** (-5.49)	-0.316*** (-7.02)
COI	0.791*** (3.72)	-0.071 (-1.09)	0.258*** (-6.02)	-0.317*** (-6.02)
LN(BS)	-0.068*** (-4.03)			
BM		-0.007*** (-4.56)		
WB			-0.001* (-1.81)	
ID				-0.001*** (-6.02)
CIF*LN(BS)	-0.528*** (-5.29)			
CII*LN(BS)	-0.555*** (-5.68)			
COF*LN(BS)	-0.691***			

	(-6.95)			
COI*LN(BS)	-0.533*** (-5.51)			
CIF*BM		-0.046*** (-4.72)		
CII*BM		-0.053*** (-4.86)		
COF*BM		-0.062*** (-5.84)		
COI*BM		-0.053*** (-4.90)		
CIF*WB			-0.007** (-2.40)	
CII*WB			-0.009*** (-3.24)	
COF*WB			-0.009*** (-3.00)	
COI*WB			-0.008*** (3.09)	
CIF*ID				-0.001 (-0.18)
CII*ID				-0.001 (-1.17)
COF*ID				-0.001 (-1.13)
COI*ID				-0.001 (-1.06)
ROA	0.001*** (3.32)	0.001*** (2.88)	0.001*** (3.12)	0.001*** (3.26)
SIZE	0.018* (1.86)	0.022** (2.15)	0.026** (2.54)	0.030*** (2.99)
MTB	0.001** (2.42)	0.001* (1.96)	0.001* (1.67)	0.030*** (2.99)
PROD	-0.087*** (-7.73)	-0.082*** (-7.20)	-0.084*** (-7.30)	-0.069*** (-5.93)
DISC	-0.210*** (-3.62)	-0.217*** (-3.66)	-0.178*** (-2.97)	-0.172*** (-2.93)
ACS	-0.001 (-0.24)	-0.001 (-0.25)	-0.000 (-0.28)	-0.000 (0.00)
ACM	-0.001 (-0.71)	0.000 (0.04)	-0.000 (-0.30)	-0.002 (-0.19)
Constant	7.035*** (3.55)	6.373*** (3.18)	7.635*** (3.53)	4.465** (2.19)
Year	Yes	Yes	Yes	Yes
Wald-chi square	519.97	481.26	452.20	493.80

***, **,* represents statistical significance at 1%, 5%, and 10% levels

Table VI shows the difference in GMM results where the impact of BC is examined over cash-flow CS. GMM Model is employed to ensure that the results are consistent, and it also addresses endogeneity issues. This model is employed to enhance the efficiency of estimates and remove the individual effects from the model. The results are mostly in line with the main results displayed in Table IV. The interaction results of cash flow and BCs (BS, BM, WB) are negative and significant. However, the interaction result of cash-flow CS and ID is negative but not significant. ID was found to have a negative and significant variable in the main results; however, as per GMM results, ID is coming as an ineffective BC in mitigating cash-flow CS.

Table VII: Moderating effect of KZ Index on cash-flow CS

Column 1	Column 2	Column 3	Column 4	Column 5
Variable	**Control for firm-level variables**	**Control for firm-level variables**	**Control for firm-level variables**	**Control for firm-level variables**
	Co-efficient (t-value)	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**
UECFO (L1)	0.036 (1.08)	0.038 (1.13)	0.027 (0.82)	0.044 (1.36)
CIF	-0.444*** (-16.50)	-0.434*** (-16.30)	-0.488*** (-18.27)	-0.483*** (-18.21)
CII	-0.445*** (-17.88)	-0.434*** (-17.57)	-0.469*** (-19.24)	-0.453*** (-18.76)
COF	-0.438*** (-16.02)	-0.432*** (-15.80)	-0.509*** (-17.69)	-0.504*** (17.82)
COI	-0.446*** (-18.06)	-0.436*** (-17.74)	-0.469*** (-19.45)	-0.453*** (-18.90)
KZ	-0.001** (-2.13)	-0.001*** (-3.58)	-0.001 (0.92)	-0.001*** (-7.74)
LN(BS)	-0.002 (-0.20)			
BM		-0.001 (-0.88)		
WB			0.000 (0.92)	
ID				-0.001*** (-5.28)
CIF*LN(BS)* KZ	0.001 (1.26)			
CII*LN(BS)* KZ	0.002*** (4.93)			

COF*LN(BS)* KZ	0.000 (0.00)			
COI*LN(BS)*KZ	0.002*** (4.83)			
CIF*BM*KZ		0.001 (0.89)		
CII*BM*KZ		0.001*** (3.69)		
COF*BM*KZ		-0.000 (-1.53)		
COI*BM*KZ		0.001*** (3.60)		
CIF*WB*KZ			0.001*** (4.69)	
CII*WB*KZ			0.001*** (4.56)	
COF*WB*KZ			0.001*** (8.02)	
COI*WB*KZ			0.001*** (4.56)	
CIF*ID*KZ				0.0001*** (2.62)
CII*ID*KZ				0.0001*** (2.68)
COF*ID*KZ				0.0001*** (7.60)
COI*ID*KZ				0.0001*** (3.23)
ROA	0.001*** (3.59)	0.001*** (3.52)	0.001*** (3.27)	0.001*** (3.23)
SIZE	0.016* (1.70)	0.016* (1.67)	0.009 (1.05)	0.015 (1.61)
MTB	0.001*** (2.24)	0.001** (2.15)	0.001** (2.49)	0.001** (2.41)
PROD	-0.089*** (-8.16)	-0.089*** (-8.22)	-0.84*** (-7.93)	-0.072*** (6.66)
DISC	-0.214*** (-3.80)	-0.209*** (-3.72)	-0.238*** (-4.35)	-0.220*** (-4.05)
ACS	-0.002 (-0.76)	-0.002 (-0.81)	-0.002 (-0.86)	-0.001 (-0.27)
ACM	-0.000 (-0.14)	0.000 (0.14)	-0.000 (-0.14)	0.000 (0.02)
Constant	5.957*** (3.10)	5.830*** (3.03)	4.167** (2.10)	0.954 (0.51)
Year	Yes	Yes	Yes	Yes
Adjusted R-Square	600.37	588.99	671.33	710.60

***,**,* represents statistical significance at 1%, 5%, and 10% levels

Table VII shows the difference in GMM results, which is employed to examine the moderating effect of the KZ index on cash-flow CS. The results are in line with the main results. The moderating impact of KZ Index on BC over cash-flow CS is significantly positive for all four variables of board characteristics, which are board size, board meeting, women on the board, and independent directors. This validates and confirms our main results.

6.1 Alternative Measure of Financial Constraints

To confirm our main result, we used the SA (Size-Age)index developed by Hadlock and Pierce (2010) as a proxy to measure financial constraints. This measure is mainly based on two factors of the firm: size and age. We used the following formula to measure the SA index:

SA Index = (-0.737*Size) + (0.043* $Size^2$)-(0.040*Age)

Where size is the natural log of total assets, and age is measured as the natural log of the current year less the year of incorporation. A similar model is employed to assess the moderating impact of financial constraints, except that size is excluded as a control variable because size and SA index are highly correlated (Zaiane et al., 2025)

Table VIII Alternative measure of Financial Constraints

Column 1	**Column 2**	**Column 3**	**Column 4**	**Column 5**
Variable	**Control for firm level variables**	**Control for firm level variables**	**Control for firm level variables**	**Control for firm level variables**
	Co-efficient (t-value)	**Co-efficient (t-value)**	**Co-efficient (t-value)**	**Co-efficient (t-value)**
CIF	-0.026 (-0.26)	-0.023 (-0.28)	-0.011 (-0.47)	0.032 (1.15)
CII	0.077 (0.69)	-0.177*** (-6.60)	0.120*** (-4.98)	-0.098*** (-3.85)
COF	-0.006 (-0.09)	0.084 (1.42)	-0.045 (-1.50)	-0.041* (-1.80)
COI	0.093 (0.87)	-0.166*** (6.46)	-0.118*** (-5.00)	-0.095*** (-3.87)
SA	0.052 (1.52)	0.054 (1.59)	0.056 (1.54)	0.024 (0.67)
LN(BS)	-0.015 (-1.41)			
BM		-0.003** (-2.13)		

WB			0.001** (2.34)	
ID				0.00 (0.01)
CIF*LN(BS)	-0.082 (-1.18)			
CII*LN(BS)	-0.141* (-1.77)			
COF*LN(BS)	-0.066 (-0.72)			
COI*LN(BS)	-0.141* (-1.85)			
CIF*BM		-0.002 (-0.14)		
CII*BM		0.007** (2.35)		
COF*BM		-0.023 (-1.19)		
COI*BM		0.006 (1.05)		
CIF*WB			-0.004 (-0.54)	
CII*WB			-0.014 (-1.54)	
COF*WB			0.001 (0.12)	
COI*WB			-0.015 (-1.65)	
CIF*ID				-0.002 (-0.98)
CII*ID				-0.001 (-0.30)
COF*ID				0.002 (0.85)
COI*ID				-0.001 (-0.18)
CIF*LN(BS)* SA	0.029 (1.46)			
CII*LN(BS)* SA	0.015 (0.63)			
COF*LN(BS)* SA	0.013 (0.53)			
COI*LN(BS)*SA	0.015 (0.63)			
CIF*BM*SA		-0.003 (-0.58)		
CII*BM*SA		0.013 (1.28)		
COF*BM*SA		0.000 (0.00)		

COI*BM*SA		0.001 (0.33)		
CIF*WB*SA			0.001 (0.53)	
CII*WB*SA			0.005 (1.53)	
COF*WB*SA			-0.001 (-0.28)	
COI*WB*SA			0.005* (1.74)	
CIF*ID*SA				0.001 (0.61)
CII*ID*SA				0.000 (0.13)
COF*ID*SA				-0.001 (-1.07)
COI*ID*SA				-0.000 (0.06)
ROA	0.002*** (7.43)	0.002*** (7.67)	0.002*** (7.33)	0.002*** (7.34)
MTB	0.001 (1.42)	0.001 (1.15)	0.001 (1.32)	0.001 (1.24)
PROD	-0.041*** (-3.08)	-0.039*** (-2.95)	-0.039*** (-3.00)	-0.039*** (-2.98)
DISC	-0.100** (-2.52)	-0.106*** (-2.67)	-0.110*** (-2.77)	-0.104*** (-2.62)
ACS	-0.004* (-1.79)	-0.005** (-2.41)	-0.005** (-2.40)	-0.004** (-2.12)
ACM	-0.000 (-0.27)	0.001 (0.55)	-0.000 (-0.01)	0.000 (0.06)
Constant	-5.523*** (-4.36)	-6.105*** (-4.87)	-4.109*** (-2.99)	-5.476*** (-4.25)
Year	Yes	Yes	Yes	Yes
Adjusted R-Square	0.165	0.152	0.1603	0.1672

Table VIII shows the moderating impact of financial constraints using an alternative proxy (SA index). In line with our main results, it confirms that BCs are not effective in restraining managers from engaging in cash-flow CS when firms are facing financial constraints. Whereas, gender diversity is positively significantly associated with the SA index, suggesting its ineffectiveness in reducing CS. These results are like the main results presented in Table V.

7. Conclusion limitations

This paper examines the impact of BCs on cash-flow CS and investigates the moderating role of financial constraints (KZ index) among non-financial Indian firms listed on the BSE 500 from 2013 to 2022. Using 1780 firm-year observations and employing the fixed-effect estimation technique, our results confirmed that Indian

firms engage in CS and misclassify their earnings by reclassifying cash flow items. To investigate the impact of BCs, we used various variables including board size, number of board meetings, gender diversity, and board independence. We find that board size and women on the board are negatively associated with cash-flow CS, implying that a larger and gender diverse board improves the quality of financial statements. Similarly, board independence is negatively associated with cash-flow CS, suggesting that it is important to have members acting as independent directors on the board, as their independent opinion helps companies to prepare financial statements of a better quality. However, the board meeting displayed mixed results. Hence, this shows that there is a need to ensure a robust internal corporate governance regime in India to ensure the presence of an effective board committee. The findings of the study contribute to the existing literature by highlighting the importance of robust firm-level governance in a country like India. These results also hold importance for the companies that aim at improving the governance at a firm level, which will translate into a better quality of financial statements.

Furthermore, we examine the moderating role of financial constraints and find that it is positively impacting the association between BCs on cash-flow CS. Hence, this finding suggests that BCs are ineffective in mitigating cash-flow CS when Indian firms are facing financial constraints. Therefore, there is a need for regulators to consider other mechanisms to improve the effectiveness of the board under financial pressure, including enhanced disclosure and better training. Also, there is an important implication for lending institutions, which signifies that a detailed analysis of financial statements and reports must be conducted before granting credit to a firm with financial constraints. To further check the robustness of the main analysis, the GMM model and an alternative proxy of financial constraints (SA index) are employed to examine whether BC and KZ-Index hold a similar impact on cash-flow CS, and we find similar results.

Our study results have various key implications for the regulatory bodies in India. For instance, the SEBI Clause 49 and the Companies Act 2013 promote board independence and require a minimum of one female director on the board. Such rules enhance the governance mechanisms, but the findings indicate that BCs effectiveness may be conditional, as we find that the impact of female and independent directors diminishes when the firms are facing financial constraints. Therefore, it highlights the need for regulators to go beyond checkbox compliance. Additionally, there is an extent of flexibility for the Indian Ind AS framework to use CS and reclassify cash flow items, leading to exploitation of financial reporting. The Ministry of Corporate Affairs and the SEBI must consider tightening the requirements related to disclosure and guide to improve transparency and mitigate cash-flow CS. The results provide evidence that there is a massive need for robust internal firm-level governance.

Despite the significant contributions, our study is subject to limitations. We employed cash-flow CS to measure earnings management; hence, other forms of CS, such as the income statement, could be employed in future work. Another limitation comes from the sample, as these results cannot be applied to financial firms since they are excluded from the analysis. Future research work can include insurance, banking, and other financial firms to determine whether the findings are consistent.

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Annexure I: Definition of Study Variables

Variable	Proxy/Measurement
UECFO	Unexpected operating cash flows
CFO	Cash flow from operating activities
AT	total value of the assets
sales	Net sales of the firm

ΔSales	Percentage change in sales
CFF	Cash flow from investing activities divided by last year's total assets of the firm
CFI	Cash flow from financing activities divided by last year's total assets of the firm
CIF	Cash inflow from financing activities divided by the last year's total assets of the firm
CII	Cash inflow from investing activities divided by last year's total assets of the firm
COF	Cash outflow from financing activities divided by last year's total assets of the firm
COI	Cash outflow from investing activities divided by last year's total assets of the firm
LN(BS)	Natural log of board size
BM	Number of board meetings held in a year
WB	Percentage of women members on the board
ID	Percentage of independent directors on the board
KZ	KZ Index to measure financial constraints
EPU	Economic policy uncertainty index of the country
INF	The inflation rate of the country
BCI	Business confidence index of the country
ROA	Return on assets is measured as profit after tax divided by total assets
SIZE	Natural log of total assets
MTB	Market value of equity to book value of equity
PROD	Abnormal production cost
DIS	Abnormal discretionary expenditure
ACS	Size of the audit committee
ACM	Number of audit committee meetings held in a year
CF	Cash-flow, measured by adding the depreciation and amortization to net income
K	Capital stock equals the sum of property, plant, and equipment
Q	Tobin Q, measured through the market value of assets/book value of assets
D	Total debt level
Total Cap	Measured by adding the shareholders' equity to total debt
Div	Total dividend payments
Cash	The sum of short-term investment and cash value
AGE	LN (Current year- year of incorporation)

Annexure II

Abnormal Production Cost (PROD)

$$\frac{PROD_t}{AT_{t-1}} = \delta_0 + \delta_1 \frac{1}{AT_{t-1}} + \delta_2 \frac{Sales_{t-1}}{AT_{t-1}} + \delta_3 \frac{\Delta Sales_t}{AT_{t-1}} + \delta_4 \frac{\Delta Sales_{t-1}}{AT_{t-1}} + e_t$$

Abnormal Discretionary Expenses (DISC)

$$\frac{DISX_t}{AT_{t-1}} = \Omega_0 + \Omega_1 \frac{1}{AT_{t-1}} + \Omega_2 \frac{Sales_{t-1}}{AT_{t-1}} + e_t$$

where DISX is discretionary expenditure, measured as the sum of SGA and research and development (R&D) expenses. AT is total assets. PROD is production costs, calculated as the sum of the cost of goods sold and change in inventory. The difference between actual production cost and predicted production cost represents abnormal production cost, which is included in the study as PROD. Similarly, the difference between actual discretionary expenses and predicted discretionary expenses represents abnormal discretionary expenses, which are included in the study as DISC.

Figure I: Marginal effect Plot of KZ Index on UECFO (For all Board Characteristics)