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Systemic Impact of Accounting Scandals on Corporate
Governance in Emerging Markets: Evidence from India

Krishnamurthy V. Subramanian; Rajesh Chakrabarti

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Introduction

As accounting scandals have become widespread across the world,¹ a pertinent question to ask is the following: How does an accounting scandal in one firm affect the other firms in the economy? While the spillover effects of accounting scandals have been examined for developed markets, such effects have not been studied for emerging markets. Yet, studying this question in emerging markets, where legal and market failures are generally more glaring, is at least as important.

An emerging market context, such as India's, offers certain key differences from the well-analyzed developed country setting for analyzing corporate governance effects. First, as Allen (2005) emphasizes, while the literature on corporate governance emphasizes that firms should maximize share-holder value, this objective function is appropriate only when markets are perfect and complete. In emerging economies, where markets are imperfect and incomplete, corporate governance may differ fundamentally, for instance, in the pursuit of the interests of all stakeholders to overcome market failures. Second, as the rule of law is weak and regulatory capacity is low in emerging economies, *de facto* implementation of laws and regulations may differ significantly from their *de jure* formulation. For instance, Allen et al. (2012) point out that dispute resolution in Indian business frequently happens through informal channels. Third, the corporate governance mechanisms that can complement a firm's board of directors in monitoring the firm's insiders—a potent market for corporate control, robust analyst coverage, trustworthy auditors, or activist institutional investors—are usually weaker in emerging markets than in developed markets. Fourth, in many emerging economies, independent directors (IDs) face significant personal liabilities (Cheffins et al., 2011) including the risk of criminal liabilities (Khanna and Mathew, 2010). Fifth, director and officer (D&O) insurance markets are very thin. As a result, even the civil liabilities end up as personal liabilities of the directors. Thus, the cost-benefit calculus that IDs face in emerging economies can differ significantly from those in developed economies. Thus, despite possible similarity in *de jure* law, corporate governance in emerging markets can differ substantially from that in advanced economies. Therefore, the externalities created by accounting scandal can be very different in emerging markets when compared to those in developed markets. In this paper, we utilize a prominent accounting scandal in India in January 2009 to examine the systematic spillovers such events can create on corporate governance in an emerging market. In an event that generated national and international attention, the founder-chairman of the fourth largest Indian software firm, Satyam Computers (hereafter Satyam), confessed to engaging in long-standing accounting fraud in collusion with the firm's auditor, PricewaterhouseCoopers

¹ *The Economist*, in its issue dated 13th Dec 2014 highlighted “If accounting scandals no longer dominate headlines as they did when Enron and WorldCom imploded in 2001-02, that is not because they have vanished but because they have become routine.” Beasley et al. (2010) find that the average dollar amount of frauds and the median size of the company undertaking the fraud increased eightfold and six-fold during 1987-2007. Also see Ball (2009).

(PwC). Because monitoring by IDs represents an important pillar of good corporate governance across the world (Denis and McConnell, 2003), we examine the spillover effects on board independence – both *de jure* and *de facto* – and monitoring by IDs.

Theoretically, the spillover effects stem from the shock induced by a prominent accounting scandal to the cost-benefit calculus that IDs face. ID positions confer private benefits – both pecuniary and reputational – that are proportional to firm performance (Fama (1980), Fama and Jensen (1983), Ferris, Jagannathan, and Pritchard (2003) and Srinivasan (2005)). However, ID positions also entail direct costs in the form of time and effort commitments, and indirect costs such as the risk of reputational damage (Fama (1980), Fama and Jensen (1983)) and potential legal liability, including the risk of being arrested and sent to jail in some countries even if the IDs are not personally involved in any fraud (Cheffins et al. 2011). A prominent accounting scandal may remind an ID of the possibility of accounting manipulation/fraud in the firm the ID is associated with and thereby increase an ID's *perceived* risk. This, in turn, increases the costs of being an ID, both from the increased monitoring effort that the ID must undertake and the reputational and legal costs if the firm suffers an adverse event. An anticipated tightening of the regulatory regime following the scandal may also alter the cost-benefit calculus for IDs by requiring more involvement/effort from IDs. These costs may force some IDs to quit the boards they sit on and may preclude other potential IDs from assuming such positions. For those IDs that decide to stay, a prominent accounting scandal may make them more vigilant and thereby enhance the quality of monitoring.

Consistent with the theoretical priors, in the wake of the Satyam scandal, IDs resigned *en masse* from *other* firms, i.e., those not involved in the scandal. Figure 1 depicts the number of listed firms in which IDs resigned in every month from July 2007-July 2010. The large number of firms that experienced such resignations in Jan 2009 is unmistakable.² The 96 exits in Jan 2009, excluding the six IDs that exited from Satyam itself, was **2.9 times** the prior monthly average of 33. With about 5000 listed companies in the two major exchanges in India and about 4.5 independent directors per board on average per listed company, the universe of IDs in listed firms equals about 22,500. While an increase of 63 ID exits may appear to be a small difference relative to the stock of IDs, the stock figure represents a wrong benchmark as the ID exits in a month represent a flow measure. Also, board appointments are usually sticky, stable arrangements, and turnover is rare. Hence the right benchmark to use is the flow measure of average monthly *exits*, not the stock measure provided by the population of IDs. Using the flow measure as the benchmark, we see that not only did Jan 2009 mark a tripling of exits, it also heralded an era of more ID exits – exits after Jan 2009 equaled 60 on average, 82% higher than the preceding period.

As we argue in section 0, the accounting scandal at Satyam provides an excellent setting to examine the spillover effects of interest. In contrast to the U.S. setting, there was no legislative/regulatory intervention in India for four years after the scandal. Second, the event was

² Anecdotal evidence confirms this finding. As *The Economic Times*, April 20, 2009 highlights: “Post Satyam, independent directors have become very choosy about the companies they associate with. Many independent directors of India Inc have quit boards in the past four months, citing reasons ranging from ill-health to work pressures.”

unanticipated and sharp—the scandal unraveled in less than a month. Thus, before–after differences in board composition and board monitoring in other firms can be meaningfully attributed to this event.

We use unique, hand-collected data for the years 2006 to 2010. Since the accounting scandal at Satyam occurred in early Jan 2009, we restrict our post-event sample to 2 years, i.e. 2009 and 2010. The Indian Companies Act was significantly amended in 2012 after (though not because of) the corporate governance failure at Satyam. Ending our sample in 2010 ensures that our sample ends two years before the new Act came into effect. Moreover, extending the sample beyond two years runs the risk of other confounding factors affecting our inferences.

We find that the accounting scandal imposed the following costs on other firms in the economy. First, IDs resigned 42% more from other Indian firms when compared to resignations prior to the accounting scandal. Because of these exits, the percentage of IDs on boards decreased by 0.35% in absolute terms. To satisfy the threshold independence requirements mandated by the stock exchanges, firms recruited new IDs. To examine the quality of IDs that resulted after the churning, we examine the percentage of expert IDs. We define an expert ID as one whose educational background includes business or law or one who is a professional lawyer, academician or government official. Consistent with our definition capturing the expertise of IDs, we find the percentage of expert IDs correlates positively with firm size and firm profitability. Crucially, we find that after the accounting scandal at Satyam the percentage of expert IDs declined by approximately 27% on an absolute basis, which corresponds to a decrease of about 41% when compared to the average percentage of expert IDs in our sample. So, *de facto* board independence is likely to have been compromised as the quality of IDs on boards declined drastically.

The accounting scandal, however, also generated the following spillover benefits. The IDs who stayed became more vigilant, as reflected in the 38.7% increase in the number of board meetings held, and the 14.9% increase in the average attendance of IDs at the board meetings. Admittedly, increases in both these measures only suggest that the necessary conditions for greater vigilance were more likely to be satisfied after the accounting scandal at Satyam. The time-series tests, however, suffer from the concern that potential omitted variables may confound the effects of the accounting scandal at Satyam.

To better identify the effects, we undertake difference-in-differences tests that utilize cross-sectional differences in the latent probability of a hidden accounting fraud. We employ a continuous difference-in-differences strategy as recommended in the literature by Atanasov and Black (2016) and implemented in Atanasov et al. (2010). To design these tests, we exploit the fact that the expected costs to an ID increase with the probability of an adverse outcome in the firm the ID is associated with – in this context, coming to light of an ongoing accounting fraud possibly unknown to the IDs. As Burns, Kedia and Lipson (2010) and Kedia and Phillipon (2009) show, the likelihood of financial mis-reporting correlates strongly with the governance in a firm. Therefore, we use a firm being booked for a governance violation during the period 2006 to 2008 either by the stock exchange or the regulator as our first proxy for the latent likelihood of an undetected fraud in a firm. Similarly, the latent probability is likely to be higher in firms that

indulge in earnings management. Therefore, we use a firm likely to be indulging in earnings management from 2006 to 2008 as our second proxy for the latent likelihood of an undetected fraud in a firm. While these firms serve as the treatment group, the remaining firms constitute the control group. Note that the assignment of firms into treatment and control groups is exogenous to the event under study here. As discussed in section 1.6, the accounting scandal at Satyam was completely unanticipated. Moreover, within the software industry, the accounting scandal was restricted to Satyam and was not due to any negative shock to the software industry in general. Thus, performance of other firms before the accounting scandal is uncorrelated with the scandal. So, we identify the effect of the accounting scandal through differences in the latent probability of an undetected fraud in the firm the ID is associated with.

We confirm all the above results using these difference-in-differences tests. First, ID exits are either restricted only to the treatment firms or are at least 23% higher in the treatment firms than in the control firms. Second, the decrease in the percentage of IDs on boards is primarily restricted to the treatment firms or is about 2.2 times higher for the treatment firms than the control firms. Third, percentage of expert IDs decreases by at least 6% more in treatment firms than in control firms. Fourth, frequency of board meetings increases by at least 14% more in treatment firms when compared to control firms. Finally, frequency of board meetings increases by at least 3% more in treatment firms than control firms.

Could a confounding factor, such as the onset of the global financial crisis (GFC), account for the above effects? First, if this were the case, the January 2009 spike should arguably have manifested in the most dramatic months of the GFC – such as March 2008 when Bear Stearns collapsed or September 2008 when Lehman Brothers collapsed. Of course, the effects could manifest with a time lag. But, firstly unlike with the Satyam scandal, the link between the GFC and ID exits is unclear. Second, it seems implausible that even in the presence of a time lag, the entire effect would pile up in one month, January, with no visible rising trend preceding it when the signature event – the Lehman Brothers collapse – happened four months before. Third, in all our tests, we examine the before-after differences coinciding with the GFC and find the differences to be statistically indistinguishable from zero.

We also reason that increased ID effort/ involvement in anticipation of enhanced regulatory oversight may not have contributed to the ID exits in Jan 2009 though it could influence exits in subsequent months as IDs may decide to not renew their expiring contracts. As regulatory changes require considerable deliberation, the anticipated speed of such changes may be glacial when compared to the haste with which IDs resigned in Jan 2009. The sudden resignations immediately in the wake of the scandal seem to indicate a panic reaction rather than a reasoned decision to quit in anticipation of a likely legislation.³

Was Satyam the only Indian company with accounting issues? The answer to that question is most probably no. Company-auditor disagreement over accounts is not unheard of but is almost without exception settled internally and never disclosed in the Indian media. Also, since these unreported conflicts are idiosyncratic occurrences, there is no reason to believe that the extent of such cases

³ We thank an anonymous referee for suggesting us to explore this alternative explanation.

was different than at other times during our period of observation. In the period that we study, Satyam was the only major accounting scandal that made headline news, helping identification in this study.

Our study highlights the differences in the spillover effects of an accounting scandal in an emerging market vis-à-vis a developed market. The ID exits witnessed after the Satyam fiasco differ from those that manifested after the wave of corporate governance failures in the U.S. in the early 2000s—at Enron, WorldCom, and Tyco, for example. No systemic exodus of IDs from corporate boards unrelated to the affected firms in the U.S. was reported in the wake of these scandals.⁴ Our study suggests that the contrasting effects stem from the cost-benefit calculus faced by IDs being different in emerging market economies than in developed markets.

To our knowledge, ours is the first study to examine the corporate governance spillovers due to an accounting scandal in an emerging market. Figure 2 summarizes the literature relating to accounting failures, which focuses primarily on developed markets. Broadly speaking, it examines the *determinants* of accounting failures on the one hand, and the *outcomes* of accounting failures on the other hand. The literature examining the determinants of accounting failures has investigated the role of managerial incentives, auditors, the composition of boards, as well as the methodologies and techniques for detection of accounting failures. The literature examining the outcomes of accounting failures can be bifurcated into those studies that examine the outcomes for involved parties including managers, directors and investors, on the one hand, and spillover effects on parties that are not involved with the accounting failures. This study contributes to this literature in two key ways. First, ours is the first study to examine the spillover effects of an accounting scandal in an emerging economy. As argued above, corporate governance in emerging economies differs substantially from that in the developed countries. Therefore, the spillover effects documented by earlier studies for developed economies may not generalize to emerging economies. Second, even without appealing to the distinctions between developed and emerging economies, we contribute to the branch of the literature that examines spillover effects on other firms. This study therefore resembles Gleason et al. (2008), who examine financial reporting in other firms, and Beatty et al. (2013), who examine investments in peer firms. This study, however, differs from Gleason et al. (2008) and Beatty et al. (2013) by focusing on boards in *other* firms.

Our study also relates to an emerging literature on corporate governance externalities. Acharya and Volpin (2010) argue that corporate governance standards spread across firms as they compete in the managerial labor market. Firms with weaker governance overpay managers forcing those with good governance to follow, reducing the overall level of governance. Levit and Malenko (2016) show that boards provide another channel for transmission. Directors' reputational concerns may create strategic complementarity of corporate governance across firms, creating vicious and virtuous cycles of poor and strong corporate governance in firms. We contribute to this area by demonstrating that a prominent scandal can affect boards of other firms through the reputational risks and fears of liability of IDs.

⁴ Our analysis of annual ID exits using the BoardEx data confirms that there was no significant change in ID exits in 2001 or 2002 when compared to 2000.

Our study focuses on the accounting scandal in India to identify the spillover effects cleanly. For several reasons, our findings have wider relevance. First, India is English-speaking and has English legal origin (La Porta, Lopez-deSilanes, Shleifer, and Vishny 1998). Thus, its legal institutions are similar to those in other English legal origin countries. Second, as Indian accounting and financial data is generally of good quality, recent studies have used the Indian context to examine other accounting and corporate finance issues (see Gormley, T., Bong Kim and Xiumin Martin, 2012; Vig 2013). Given these institutional and legal similarities of India to the commonwealth countries and most importantly, the USA, the conclusions of a case study of systemic effects in India are generalizable beyond the boundaries of the country or the geographical region and are likely to apply in principle (subject to other country-level institutional peculiarities) to a large part of the globe including several developed countries. The Indian context therefore provides a laboratory setting to study the spillover effect for a far wider context.

Empirical Hypotheses

We examine empirically the spillover effects of a prominent accounting scandal on board composition and board monitoring in other firms, i.e firms not connected with the Satyam scandal (hereafter “unconnected firms”). On the one hand, a prominent accounting scandal increases the perceived risk of accounting manipulation/fraud in the firm the ID is associated with. This, in turn, increases the costs of being an ID and thereby may increase IDs’ reluctance to either stay on or join corporate boards. On the other hand, for those IDs that decide to stay, a prominent accounting scandal may make them more vigilant and thereby enhance the quality of monitoring.

1.1 Costs and benefits of directorship positions

The prior literature argues that the benefits of ID positions are proportional to firm performance. Ferris, Jagannathan, and Pritchard (2003) show that directors associated with firms that perform better receive more offers for ID positions. On the flip side, directors who resign following accounting restatements are likely to receive relatively fewer directorships (Srinivasan (2005)). Also, outside directors build reputation through the performance of the companies on whose board they serve, creating opportunities for more (and more prestigious) directorships for themselves (Fama, 1980, Fama and Jensen, 1983). Thus, the benefits to outside directors are closely linked to the performance of the firms on which they serve as outside directors.

But, ID positions entail direct costs in the form of time and effort commitments, and indirect costs such as the risk of reputational damage (Fama, 1980, Fama and Jensen, 1983) and potential legal liability, including the risk of being arrested and sent to jail in some countries even if the IDs are not personally involved in any fraud (Cheffins et al. 2011). An anticipated tightening of the regulatory regime following the scandal may also alter the cost-benefit calculus for IDs by requiring more involvement/effort from IDs. See Section 1.7 for details on the costs faced by IDs in India.

As a prominent accounting scandal increases the (perceived) likelihood of an accounting fraud in other firms, IDs face greater costs on all these counts. As these costs are borne by IDs privately, a

prominent accounting scandal is likely to have the spillover effect that IDs would exit from their ID positions in other firms. Also, individuals are less likely to assume ID positions in other firms.

***HYPOTHESIS 1:** A prominent accounting scandal leads to exit of IDs from unconnected firms, i.e. firms not involved in the scandal.*

1.2 Spillover effects on board composition

First, we expect that existing IDs would resign from their position and some potential IDs (who would have taken up an ID position in the absence of the accounting scandal) would decide not to take up the position. As Denis and McConnell, (2003) points out, many countries mandate threshold levels of board independence. In the Indian case, the Securities and Exchange Board of India (SEBI), the Indian equivalent of the SEC, promulgated in 2000, the Clause 49 of the stock exchange listing agreement. This key regulatory change affected the characteristics of boards of directors in Indian listed firms. Clause 49 (i) sets out the threshold requirements for IDs on corporate boards, (ii) defines independence, and (iii) lays out some specific duties and obligations of IDs. Under Clause 49, all publicly traded Indian firms with paid up capital above Rupees 3 crores (~US\$600,000) are required to have a board that includes at least one-third IDs. Furthermore, publicly traded firms in which the chairman of the board is an executive of the firm are required to have a board composed of at least 50% IDs. Since some companies may enjoy a cushion above the mandatory level of board independence, we expect a reduction in the percentage of IDs on corporate boards post the revelation of a prominent accounting scandal.

***HYPOTHESIS 2:** A prominent accounting scandal leads to reduction in the percentage of IDs on boards of unconnected firms, i.e. firms not involved in the scandal.*

Second, IDs are far from uniform in their expertise. Because an expert ID faces disproportionately greater costs from potential damage to his/her reputation, an expert may simply refuse such positions or exit from his/her existing positions. Since companies are mandated by regulation to have a certain proportion of IDs on the board, we expect that firms would have to go down the quality ladder to fill up vacant ID positions. Therefore, the average percentage of expert IDs on the boards of other firms would diminish post the revelation of an accounting scandal.

***HYPOTHESIS 3:** A prominent accounting scandal leads to reduction in the percentage of expert IDs on boards of unconnected firms, i.e. firms not involved in the scandal.*

1.3 Spillover effects on monitoring by IDs

An accounting scandal highlights risks faced by IDs from the hard-to-detect actions of insiders. So, we expect IDs to exert greater effort in minimizing the information deficit they face with companies' insiders. Since regular board meetings and attendance in these meetings are necessary (though not necessarily sufficient) to minimize this information deficit, we expect the number of board meetings held and the attendance in these meetings to increase post the revelation of a prominent accounting scandal.

HYPOTHESIS 4: *A prominent accounting scandal leads to an increase in monitoring effort by continuing IDs on the boards of unconnected firms, i.e. firms not involved in the scandal.*

1.4 Cross-sectional differences

The likelihood of an adverse event, such as an accounting fraud or failure, is greater in firms that have previously been involved in governance violations. As a result, the costs associated with being an ID increase disproportionately more in firms that are involved in governance violations when compared to firms that are not involved in such violations. Similarly, firms that indulge in earnings management are more likely to be involved in an accounting fraud or failure when compared to firms that do not indulge in earnings management. These cross-sectional differences therefore lead to predictions based on the *a priori* likelihood of a firm being impacted by an accounting scandal.

HYPOTHESIS 5: *Compared to firms that have not been involved in a governance violation, firms involved in a governance violation experience a disproportionate effect due to a prominent accounting scandal on (i) ID exits, (ii) percentage of IDs on boards, (iii) percentage of expert IDs on boards, and (iv) monitoring effort by continuing IDs.*

HYPOTHESIS 6: *Compared to firms that do not indulge in earnings management, firms indulging in earnings management experience a disproportionate effect due to a prominent accounting scandal on (i) ID exits, (ii) percentage of IDs on boards, (iii) percentage of expert IDs on boards, and (iv) monitoring effort by continuing IDs.*

Institutional Background

1.5 The Accounting Scandal in India in 2009

The accounting scandal in India that we study occurred at the prominent software firm Satyam Computer Services Limited (hereafter Satyam). Satyam was founded in 1987 by B. Ramalinga Raju, who became the firm's chairman. After its inception, Satyam grew rapidly into a \$4 billion enterprise. By 2008, it was the fourth largest Indian software company, with operations around the globe and reputed clients such as the World Bank and GE. Satyam had developed a stellar reputation for its corporate governance practices and had received several awards for the same. The non-executive directors on its board included academics from India and abroad, such as Professor Krishna Palepu of Harvard Business School, the then Dean of the Indian School of Business, industry experts such as Vinod Dham (the inventor of the Pentium chip at Intel), and a former top civil servant. In short, on the eve of its crisis, Satyam shone as one of the brightest jewels in India's corporate crown.

Satyam came under the media spotlight on 16th Dec 2008, when its board unanimously approved the acquisition of two family-owned companies using its \$1.2 billion cash holding. However, the acquisitions were called off a few hours later when institutional investors, particularly foreign institutional investors in the U.S., resisted by labeling it a self-dealing transaction. Three weeks later, on the morning of 7th Jan 2009 Satyam's Chairman disclosed that the firm had been fudging

its accounts for several years with the cooperation of the firm's auditor, PwC, and that its \$1.2 billion cash holding was the result of a long-drawn accounting fraud and largely did not exist. Satyam's shares fell by 77.47% that day, and the benchmark market indices—BSE Sensex and Nifty—fell by 7.25% and 6.18% (4.43% and 4.19% after removing the effect of Satyam) respectively.

Ramalinga Raju has spent six years in jail till 2015, along with two auditors from PwC, as an under-trial when he received a seven year jail term for his offence, and was released for time already served.. Apart from a sustained barrage of vilification and aspersions on their competence and character in the national and international media, Satyam's directors have been subject to intense questioning by the Criminal Bureau of India (CBI) and the federal government's Serious Fraud Investigation Office (SFIO). Class-action lawsuits were filed by U.S. investigators, although not in India because class-action suits by shareholders are not permitted in India.

1.6 An exogenous event to examine spillover effects

The accounting scandal at Satyam provides us with a clean shock to examine the spillover effects of an accounting scandal. As stated above in section 1.1, the expected costs to an ID equal the likelihood of an adverse event in the firm with which the ID is associated multiplied by the personal liabilities incurred by the ID conditional on such an event. IDs' perceived likelihood of accounting manipulation in an Indian firm increased after the accounting scandal at Satyam. IDs must rely on audited financial information to assess the health of the firm with which they are associated. In the case of September, the auditor itself colluded with the firm's insiders in perpetrating the accounting fraud. Therefore, IDs' fears about accounting manipulation escalated after the accounting scandal at Satyam. In other words, if a company with such a stellar reputation could be fudging its books in collusion with the firm's auditors, then any Indian firm could be indulging in accounting manipulation.

A few important features relating to the accounting scandal at Satyam makes it a clean event to examine its spillover effects. First and foremost, unlike in the U.S., regulators and policymakers in India resisted the temptation to respond to this highly publicized event with an immediate regulation or legislation. As the Satyam scandal was essentially an accounting fraud with no proven complicity of IDs, it was not clear that this was a regulatory lapse. Unlike in the U.S., where any spillover effects get confounded by the effects of the subsequent regulation, we can estimate the unadulterated spillover effects using the accounting scandal at Satyam. Second, the scandal was completely unexpected. Because the scandal involved a firm that was extraordinarily feted for its corporate governance practices and was in the information technology industry—the internationally recognized “poster child” for its professionalism and competition—the accounting scandal at Satyam was completely unexpected. Third, the scandal unraveled within a short time span of three weeks. Finally, any board-level changes in other firms (i.e. those excluding Satyam) are unlikely to be confounded by unobserved, firm-specific factors coinciding with the precise time of the change because they were the result of an unanticipated shock that was external to the firms in question. Therefore, we argue that the accounting scandal at Satyam represents an *exogenous increase in the perceived risk of accounting fraud/ failure in other firms.*

1.7 The Legal Implications for Independent Directors and Their Concerns

The Satyam fiasco combined with the legal ambiguities relating to the fiduciary duties of IDs in India to increase the perceived risk of personal liability. Neither the listing standards in the Indian stock exchanges nor The Indian Companies Act (1956): (i) differentiate the role of outside directors vis-à-vis that of the internal (executive) directors, promoter-affiliated directors or the nominee directors; or (ii) define the fiduciary responsibilities/ legal liability faced by IDs with any real precision. Khanna and Mathew (2010) find that the IDs on Indian boards believed that “the current scope for ID liability was very high and included a bona fide, non-trivial risk of criminal liability. Such liability was often arbitrarily imposed and was not offset by adequate directors’ and officers’ insurance coverage.” They find that “IDs desired: (i) seemingly basic protections against being served arrest warrants based on claims of corporate malfeasance clearly outside the IDs control, such as bounced checks and factory accidents; and (ii) clear safe harbors that would insulate them from liability for reliance on information provided by auditors and management.”⁵ The absence of the D&O insurance market in India implies that any (civil) liabilities faced by IDs have to be borne personally. Legal experts opine that “Independent directors are often fearful about [potential liability] (and understandably so) for two reasons: (i) they are not involved in the day-to-day activities of the company although they may bear some responsibility for the actions of management; and (ii) there are myriad directions from which liability could strike since directors are responsible (subject to exceptions) for violation of various statutes by companies, particularly for the so-called socio-economic offences. There is “fear of the unknown” on both these counts.” (Varottil, 2009).

Data and proxies

1.8 Data on board and director characteristics

Using mandatory filings made to the Bombay Stock Exchange (BSE) by listed companies, we hand collect a unique dataset of board and director characteristics. We focus on BSE-listed firms that comply with Clause 49 of the stock exchange listing requirements. As part of their listing requirements at the BSE, firms are mandated to file information on (i) all director appointments and director exits along with the date of appointments and exits on the board; (ii) the classification of each director on the board into “ID,” “non-executive, non-ID,” “executive director,” “promoter director” and “nominee director”;⁶ (iii) the designation of each director on the board; and (iv) director characteristics such as educational qualifications and professional experience. We hand

⁵ Deepak Parekh, a reputed Indian banker who was put in charge of Satyam after the fiasco, notes that he was under pressure from his family to step down from the boards of several companies: “If there is some serious accident in any of these companies, will I go to jail? I don’t want to be the chairman of a board.” (Sinha and Mukherjee, 2010). In an infamous case, one of the reputed investment bankers in India, Mr. Nimesh Kampani, had to stay in Dubai for several months to avoid arrest arising out of an accounting fraud in a company where he was an independent director, though he had left the board long before the irregularity was even detected.

⁶ In India, the term “promoter” is employed for the founding owners of the firm. A “promoter director” therefore refers to the promoter occupying a director’s position. Also in India, banks that provide the loan to the firm get to appoint their representative on the firm’s board. The term “nominee director” is used for the bank’s representative.

collect these data using information from the Directors Database. For each director, we extract the educational background and the occupation.

Our sample comprises of annual observations on 2653 firms excluding Satyam for the years 2006 to 2010. Since the accounting scandal at Satyam occurred in early Jan 2009, we restrict our post-event sample to 2 years, i.e. 2009 and 2010. The Indian Companies Act was enacted in 2012 in response to the corporate governance failure at Satyam. Ending our sample in 2010 ensures that our sample ends two years before the provisions of the new act came into effect. Moreover, extending the sample beyond two years runs the risk of other confounding factors affecting our inferences.

1.9 Data on governance violations

We obtain data on governance violations by a firm from the website www.watchoutinvestors.com, which is a national web-based registry developed by The Ministry of Corporate Affairs, Government of India. The website registry covers such entities including companies, intermediaries and individuals who have been indicted for an economic default and/or have been non-compliant of laws/ guidelines and/ or are no longer in the specified activity. This website has information about more than 1,27,000 persons/ entities who have been indicted for any economic offence by the regulators as notified by the Government, including regulators such as SEBI, BSE, Central Board of Excise & Customs, Central Bureau of Investigation (equivalent of the Federal Bureau of Investigation in the U.S.), Competition Commission of India, Competition Appellate Tribunal, Ministry of Corporate Affairs, Ministry of Finance, Department of Revenue and the Reserve Bank of India.

1.10 Financial and other information

We combine this data with financial and other information from the Prowess database maintained by the Centre for Monitoring Indian Economy, Mumbai, India (CMIE). The Prowess database provides information on board size, number of board meetings held, number of board meetings attended by each director and annual financial information for each of the companies. Using each company's annual reports, we have cross-checked the information pertaining to board size, number of board meetings as well as the number of board meetings attended by each director. Our final sample comprises of a maximum of 13,265 (firm, year) observations (=2653*5). Because of missing values for some of the variables, our sample size is lower in many tests.

1.11 Proxies

To investigate Hypotheses 1 and 2, we use the number of ID exits and the percentage of IDs on the board respectively, which are directly measured in our data. We now describe the proxies we employ for examining Hypotheses 3 and 4 pertaining to expert IDs and the quality of ID monitoring. To investigate Hypotheses 5 and 6, we use proxies for governance violations and earnings management described later.

1.11.1 Proxy for expert IDs

Using a keyword search, we classify directors as “expert” if the director’s “educational background” returned a business/law degree or if the “occupation” returned lawyer, academic or government official.⁷ It is fair to question our definitions of expertise. Indeed, sometimes technical expertise (such as a director with Ph.D. in material science in a steel company) can be a significant resource for the company. However typically when independent directors get into technical advisory roles, they are paid consulting fees and cease to be “independent” directors but continue as “non-executive” directors on the board. For instance, even in Satyam itself, Professor Krishna Palepu of Harvard Business School was in such a role. As directors, their role is rather that of monitoring in nature, for which law and business become the relevant disciplines. A person with an advanced technical degree may well be at a loss in a board-room discussion that typically centers around business matters. Former government officials, however, are highly sought after as IDs primarily because of their network and influence among regulators. As they are experienced in running large organizations, they can be effective in the boardroom.

1.11.2 Proxies for ID monitoring

We employ two different proxies for ID monitoring: (i) the number of board meetings held; and (ii) average attendance of IDs in the board meetings. Vafeas (1999) argues that the number of board meetings and the attendance of directors in the board meetings present reliable proxies for the monitoring effort by directors on the board. We therefore use these two variables to proxy monitoring effort by IDs.

1.11.3 Proxy for governance violation

To proxy governance violations, we include violations booked by the stock exchange BSE and the regulator SEBI. The list of violations that are covered by the involved firms include: (i) did not comply with SEBI regulations, (ii) did not comply with listing agreement/ regulations, (iii) did not deliver bonus shares, (iv) did not deliver shares as promised, (v) did not pay promised dividend, (vi) did not pay share sale proceeds, (vii) did not resolve investor's complains, (viii) did not submit corporate governance report, (ix) did not submit shareholding pattern as required under provisions of clause 35 of the listing agreement, (x) indulged in creating artificial volume and price manipulation, (xi) indulged in execution of unauthorized transactions, (xii) provided incorrect information, and (xiii) indulged in misconduct or unprofessional conduct. We generate a dummy to capture if a firm was booked for a SEBI or BSE violation in any year from 2006 to 2008.

⁷ For a business degree, we searched (i) “M.B.A.”/“Masters in Business Administration”; (ii) “Post Graduate Diploma in Business Management”/“PGDM”; (iii) “Bachelor in Commerce”/“B.Com”; (iv) “Chartered Accountant” or “CA”; and (v) “Chartered Financial Analyst” or “CFA.” For a law degree, we searched (i) “LL.B.,” which is the Indian equivalent of a Bachelor’s degree in Law, and (ii) “LL.M.,” which is the Indian equivalent of a Master’s degree in Law. For lawyers by profession, we searched “Legal Counsel,” “Lawyer,” and “Advocate”. For academics, we searched “Lecturer,” “Reader,” “Professor,” “Faculty,” “Dean,” and “Vice Chancellor”. For government officials, we searched “Secretary,” “Government of India,” and “Minister”.

1.11.4 Proxies for earnings management

We use three different proxies for earnings management. First, we use high level of discretionary accruals as measured using the model employed in Kothari et al. (2005). Specifically, we use a dummy that equals 1 if the firm employs a high (above median) level of discretionary accruals and 0 otherwise. Second, Burgstahler and Dichev (1997) and Degeorge, Patel and Zeckhauser (1999) identify small positive income and small positive profits as proxies for earnings management by firms. In the cross-sectional distributions of earnings, Burgstahler and Dichev (1997) find unusually low frequencies of small losses and unusually high frequencies of small positive income, which they infer is associated with earnings management. Degeorge, Patel and Zeckhauser (1999) find similar evidence using return on assets to proxy profitability. By examining the cross-sectional distributions of earnings per share and return on assets for Indian firms, we find similar patterns of unusually high frequency of small positive income and small positive profits when compared to small negative income or small negative profits. We therefore employ a firm reporting a small positive income, i.e. EPS between INR 0.01 and INR 0.25 million, as a proxy for earnings management based on the Earnings per share (EPS) and a firm reporting a small positive profit, i.e. ROA between 0% and 1%, as a proxy for earnings management based on the Return on assets (ROA).

1.12 Descriptive Statistics

The descriptive statistics for the variables used in the analysis are provided in Table 1. Notable is the fact that for the median & average firm in our sample, approximately 46% of the directors on the board are independent. Because Clause 49 requirements mandate that at least one-third of the board must be IDs, this statistic suggests that several firms in our sample have more IDs than legally mandated. The median firm in our sample does not experience an ID exit. Conditional on a firm experiencing an ID exit, most firms experience one ID exiting the board while the maximum number of exits is two. Board size for the typical Indian firm equals seven in India, which are a little smaller than the boards of US firms; Boone et al. (2007) for example report that the average board size for US firms equals 9.35. The board of the typical Indian firm meets about seven times per year with the average attendance of IDs being approximately 60%. Finally, based on our definition for expert ID, we note that about 65% of the IDs are classified as experts on average. Figure 1 shows the number of exits by IDs per month during the period July 2007 to July 2010. The *en masse* exit of IDs immediately after the accounting scandal at Satyam, as evidenced by the sharp increase in ID exits in Jan 2009, is unmistakable. Figure 1 also shows that the number of exits per month is greater following Jan 2009. These exits do not include either the exits from Satyam or the exits by erstwhile Satyam directors from other firms.

Empirical Strategy

Our empirical strategy comprises primarily of two parts.

1.13 Time-series tests

In the first part, we employ time-series tests that exploit the shock provided by the accounting scandal at Satyam to examine the average before-after difference on the outcome variables. As part of these tests, we also examine the before-after differences using the onset of the Global Financial Crisis as the shock to investigate if the effects stem from the same instead of the shock due to the accounting scandal at Satyam. The time-series tests, however, suffer from the concern that potential omitted variables may confound the effects of the accounting scandal at Satyam.

1.14 Difference-in-differences tests

To make progress on identification, as the second part of our empirical strategy, we utilize cross-sectional differences in the probability of an undetected accounting fraud in other firms (i.e. firms not involved in the Satyam scandal) to undertake difference-in-differences (DiD) tests.

We employ a “continuous DiD” strategy to employ the terminology advanced by Atanasov and Black (2016) and implemented in Atanasov et al. (2010). The rationale behind these tests is as follows. As explained in section 1.1, the expected cost to an ID equals the probability of an adverse outcome (in the firm the ID is associated with) multiplied by the actual liability conditional on such an adverse outcome. The accounting scandal at Satyam increased the perception of an undetected fraud in other Indian firms. Since the expected costs to an ID increase with the probability of an adverse outcome, we can use the *a priori* probability of an undetected accounting fraud in the firm the ID is associated with to separate firms into control and treatment groups. As this probability is a latent variable, we employ two separate proxies for this latent probability.

First, as Burns, Kedia and Lipson (2010) and Kedia and Phillipon (2009) show, the likelihood of financial mis-reporting correlates strongly with the governance in a firm. Therefore, we expect firms that were booked for a governance violation either by the stock exchange in which the stock was traded (BSE) or by the regulator (SEBI) to correlate strongly with the probability of a undetected accounting fraud. Motivated by the evidence in Burns, Kedia and Lipson (2010) and Kedia and Phillipon (2009) of the strong correlation between the likelihood of financial mis-reporting and governance in a firm, we focus on governance violations to the exclusion of violations recorded by the Central Board of Excise and Taxes or other regulators such as the Reserve Bank of India. Therefore, as our first proxy for the latent likelihood of an undetected fraud in a firm, we use firms that were booked for a governance violation before the accounting scandal as the treatment group; other firms constitute the control group. Similarly, such costs are likely to increase disproportionately more in firms that indulge in high level of earnings management when compared to firms that do not do so. Therefore, as our second proxy for the latent likelihood of an undetected fraud in a firm, we use firms that indulge in high level of earnings management before the accounting scandal as the treatment group. Firms that undertook low level of earnings management before the scandal constitute the control group.

Note that the assignment of firms into treatment and control groups is exogenous to the event. As discussed in section 1.6, the accounting scandal at Satyam was completely unanticipated. Moreover, within the software industry, the accounting scandal was restricted to Satyam and was not due to any negative shock to the software industry in general. Thus, performance of other firms (i.e. other than Satyam) before the accounting scandal is uncorrelated with the scandal. Therefore,

we identify the effect of the accounting scandal in India through differences in the ex-ante probability of an undetected fraud in the firm the ID is associated with. We use the following regression specification:

$$y_{i,t} = \beta_0 + [\beta_1 * TreatedFirm_i + \beta_2] * DummyForPostAccountingScandal_t + \beta_3 * Treated Firm_i + \varepsilon(i,t) \quad (1)$$

TreatedFirm_i equals 1 for a firm that has been booked for a governance violation in any year from 2006 to 2008 and 0 otherwise when we use governance violations to proxy the latent probability of an undetected accounting fraud. *TreatedFirm_i* equals 1 for a firm that indulges in high level of earnings management and 0 otherwise when we use earnings management to proxy the latent probability of an undetected accounting fraud. *DummyForPostAccountingScandal_t* equals 1 for years 2009 and 2010 and 0 for years 2006 to 2008. In the above specification, β_1 estimates the effect of an accounting scandal in India on outcome variables as a difference-in-difference, i.e., the before–after difference in treatment firms versus the same difference in the control group of firms.

Results from time-series tests

We begin our analysis using time-series tests that investigate Hypotheses 1-4.

1.15 Spillover effects on ID exits

To start with, we examine Hypothesis 1, i.e. if IDs exit from other firms after the accounting scandal at Satyam. Figure 1 shows that ID exits increased substantially after the accounting scandal at Satyam. To examine this effect in a multivariate framework, we use the following regression:

$$ID\ exits(i,t) = \beta_i + \beta_1 * Dummy\ for\ Post\ Accounting\ Scandal\ (t) + \beta * X(i,t) + \varepsilon(i,t), \quad (2)$$

where Dummy for Post Accounting Scandal (t) equals 1 for 2009–2010 and 0 for 2006–2008 and X(i,t) denotes the set of control variables for firm i at time t. In all our regressions, we estimate standard errors that are robust to heteroskedasticity and are clustered by firm. Even though the number of ID exits is a count variable, we use the ordinary least squares regression because of the incidental parameters problem with nonlinear models (such as Poisson) in the presence of fixed effects.

The set of control variables we employ is similar to that employed by Linck *et al.* (2009). Because ID resignations may have been motivated by the riskiness of a firm, we use the volatility of a firm's stock return to capture firm risk. We include the logarithm of sales as a proxy for firm size to capture additional risk associated with smaller firms. To account for the fact that more IDs may have resigned from firms that were performing poorly, we include the firm's return on assets (ROA). To control for the fact that IDs may have resigned more from firms that are more financially riskier due to their higher leverage, we follow Linck *et al.* (2009) and include the firm's debt-equity ratio. Finally, because Satyam was a family-owned firm, IDs may be more likely to exit from firms controlled by families. Therefore, we include the promoter's shareholding as well as the percentage of promoter directors on the board to proxy firms that are owned and/or

controlled by families. The firm fixed effects (β_i) enable us to control for unobserved firm-specific factors that may have motivated ID exits.

Table 2 shows the results obtained by estimating equation (1). In Column 1, we examine the effect of an accounting scandal in India on ID exits after including only firm fixed effects and find that the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant. In column 2 we test by including the full set of control variables and find again that the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant. The loadings on the control variables are all expected lines. Specifically, we find that ID exits are more likely in less profitable firms as seen by the negative and statistically significant coefficient on ROA and firms with greater financial risk as seen by the positive and statistically significant coefficient on the debt-equity ratio. Surprisingly though, ID exits are more likely in firms where promoter directors occupy a smaller percentage of the board seats.

Economically, given the mean level of exits for a firm in a given year (=0.34 in Table 1), we find in columns 1 and 2 that the accounting scandal at Satyam increased ID exits by 41.7%. These effects are economically quite large. To account for the possibility that ID exits may be more numerous in firms with larger boards, in column 3, we employ the number of ID exits divided by the size of the board:

$$ID\ exits(i,t)/Board\ size(i,t) = \beta_i + \beta_1 * Dummy\ for\ Post\ Accounting\ Scandal\ (t) + \beta * X(i,t) + \varepsilon(i,t) \quad (3)$$

We find the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant even after we normalize by the size of the board. Thus, the evidence in columns 1-3 of Table 2 is consistent with Hypothesis 1.

1.16 Spillover effects on board independence

The tests in columns 1 and 2 do not provide a complete picture of the spillover effects because potential IDs may also decide not to assume ID positions after the accounting scandal at Satyam. So we now examine the effect on the percentage of IDs on boards. Columns 4-6 of Table 2 show the results of these tests. In column 3, we run the following regression:

$$\%IDs(i,t) = \beta_i + \beta_1 * Dummy\ for\ Post\ Accounting\ Scandal\ (t) + \beta * X(i,t) + \varepsilon(i,t) \quad (4)$$

where X(i,t) denotes control variables that may be correlated with board independence.

Again, we include control for variables similar to those in the existing literature. Following Linck et al. (2009), we include the log of sales to capture firm size, stock return volatility to proxy firm-level risk and information asymmetry, and debt-equity ratio to proxy for the firm's financial risk. Linck et al. (2009) find that firm performance proxies a CEO's power and that CEO power is negatively correlated with board independence. Therefore, we include the firm's return on assets (ROA) as a proxy for firm performance. Morck and Yeung (2003) argue that when a family controls a group of firms, agency costs arise because managers act on behalf of the controlling family but not necessarily on behalf of shareholders. Therefore, we include the proportion of equity held by the promoter and the percentage of promoter directors on the board to proxy for agency costs in Indian family-owned firms.

We find in column 4 that the coefficient of the Dummy for Post Accounting Scandal (t) is negative and statistically significant. Post the accounting scandal at Satyam, the percentage of IDs on Indian

corporate boards declined by 0.35%. Since Clause 49 of the stock exchange listing agreement mandates that firms maintain a certain threshold level of IDs, firms have to appoint new IDs to replace the IDs that resigned. Therefore, we do not expect the percentage of IDs on boards to be radically different post the accounting scandal at Satyam. While the quantity of IDs on boards did not seem to change significantly, *de facto* independence of boards depends critically on the quality of IDs. We examine the effect on the quality of IDs in section 1.18.

1.17 Separating the effect due to the onset of the financial crisis

Are the above results due to the accounting scandal at Satyam or are they due to the increase in risk perceptions created by the onset of the financial crisis dating back to September 2008, when the Lehman Brothers failure occurred? We note that in Figure 1 that the jump in ID exits occurred in January 2009. The spike during this month makes it implausible that the ID exits occurred because of the financial crisis. If this was the case, the spike should have manifested in either Mar 2008 (the collapse of Bear Stearns) or Sep 2008 (the Lehman Brothers collapse). In fact, during the three months between the onset of the financial crisis and the accounting scandal at Satyam (October to December 2008), ID exits were no different from those in the preceding months. Of course, one could argue that there could be a time lapse between the onset of the financial crisis and ID exits. However, unlike in the Satyam scandal, the link between the crisis and ID exits is unclear. Also, it seems implausible that even in the presence of lags, the entire effect would pile up in one month, January with no rising trend preceding it when the signature event – the Lehman Brothers collapse – happened four months before. Thus, Figure 1 shows that the *en masse* exit by IDs took place because of the accounting scandal at Satyam and not because of the onset of the financial crisis.

Nevertheless, we examine this concern in our multivariate tests as well. To do so, we separate our sample period into two non-overlapping time periods and test using these time periods. First, we examine the difference in the percentage of IDs in 2009 and 2010 vis-à-vis that in 2008 to capture the effect of an accounting scandal separate from the effect of the onset of the financial crisis, as indicated in column 5 of Table 2. Second, we examine the difference in percentage of IDs in 2008 vis-à-vis that in 2007 to capture the pure effect of the onset of the financial crisis, as indicated in column 6 of Table 2. Column 6 shows that the coefficient of the Dummy for Start of Financial Crisis, which equals one for the year 2008 and zero for the year 2007, is statistically indistinguishable from zero. In contrast, in column 5, the coefficient of the Dummy for Post Accounting Scandal (t) is negative and statistically significant. Thus, the decrease in the percentage of IDs was plausibly due to the accounting scandal at Satyam. Among the control variables, we find that the percentage of promoter directors correlates negatively with board independence. Thus, the evidence in columns 4-6 of Table 2 is consistent with Hypothesis 2.

1.18 Spillover effects on percentage of expert IDs

We now examine the effect of an accounting scandal on the percentage of expert IDs, where expert IDs are as defined in section 1.8. The results of these tests are shown in Table 3. In column 1, we test without including any control variables (except firm fixed effects) and find that the coefficient

of the Dummy for Post Accounting Scandal (t) is negative and statistically significant. Economically, we find that after the accounting scandal at Satyam, the percentage of expert IDs on boards reduced on an absolute level by 26.9%. Given the mean percentage of expert IDs in our sample (= 65.1 in Table 1), this corresponds to a 41.3% decrease in the percentage of expert IDs, which is quite large. As we had argued in section 1.2, the reputational costs are significantly higher for expert IDs when compared to the average ID. So, post the Satyam scandal, we find a large decrease in the percentage of expert IDs on boards.

In columns 2-4, we test for this effect after including all other control variables. The specifications employed and the set of control variables included are identical to those used in Columns 4-6 of Table 2. We find that the coefficient of the Dummy for Post Accounting Scandal (t) is negative and statistically significant in these tests. Furthermore, a comparison of columns 3 and 4 in Table 3 shows that the decrease in the percentage of expert IDs was not caused by the onset of the financial crisis but was more plausibly the result of the accounting scandal at Satyam.

Among the control variables, as in the U.S., we find that larger Indian firms have more expert IDs on their boards as seen from the positive coefficient of the log of sales. Consistent with the reputational costs being higher for expert IDs, we find that the percentage of expert IDs is higher in profitable firms. Because better firm performance reduces the likelihood of adverse outcomes that engender reputational costs for expert IDs, these correlations are consistent with higher reputational costs for expert IDs. Thus, the evidence in Table 3 is consistent with the Hypothesis 3.

1.19 Spillover Effects on Monitoring by IDs

We now examine the effects on monitoring by IDs.

1.19.1 Spillover Effects on Frequency of Board Meetings

We first examine the effect on the frequency of board meetings. The results of these tests are shown in Table 4. Even though the number of board meetings is a count variable, we employ ordinary least squares regressions because nonlinear models such as Poisson or the negative binomial models suffer from the incidental parameters problem in the presence of fixed effects. In column 1, we test without including any control variables (except firm fixed effects) and find that the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant. Economically, we find that after the accounting scandal at Satyam, the frequency of board meetings on boards increased on an absolute level by 2.9 per year. Given the mean frequency of board meetings in our sample (= 7.5 in Table 1), this corresponds to a 38.7% increase in the frequency of board meetings, which is quite large.

In columns 2-4, we test for this effect after including all other control variables. The specifications employed and the set of control variables included are identical to those used in Table 3. We find that the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant in these tests. Furthermore, a comparison of columns 3 and 4 in Table 4 shows that the increase in the frequency of board meetings was not caused by the onset of the financial crisis but was more plausibly the result of the accounting scandal at Satyam. Economically, in these

multivariate tests, we find that the frequency of board meetings increased by approximately 2.8 per year on an absolute basis, which corresponds to a 37.4% increase compared to the average frequency of board meetings. Thus, the evidence in Table 4 is consistent with the Hypothesis 4.

1.19.2 Spillover Effects on Attendance of IDs in Board Meetings

As our second proxy for monitoring effort by IDs, we examine the effect on the attendance of IDs in board meetings. The results of these tests are shown in Table 5. In column 1, we test without including any control variables (except firm fixed effects) and find that the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant. Economically, we find that after the accounting scandal at Satyam, the attendance of IDs in board meetings on boards reduced on an absolute level by 9.4%. Given the mean attendance of IDs in board meetings in our sample (= 63% in Table 1), this corresponds to a 14.9% increase in the attendance of IDs in board meetings, which is quite large.

In columns 2-4, we test for this effect after including all other control variables. The specifications employed and the set of control variables included are identical to those used in Table 3. We find that the coefficient of the Dummy for Post Accounting Scandal (t) is positive and statistically significant in these tests. Furthermore, a comparison of columns 3 and 4 in Table 5 shows that the increase in the attendance of IDs in board meetings was not caused by the onset of the financial crisis but was more plausibly the result of the accounting scandal at Satyam. Economically, in these tests, we find that the attendance of IDs in board meetings increased by approximately 9.1% on an absolute basis, which corresponds to a 14.4% increase compared to the average attendance of IDs in board meetings for the sample. Thus, the evidence in Table 5 is also consistent with the Hypothesis 4.

Results from difference-in-differences tests

As Atanasov and Black (2016) describe, to ensure internal validity of a difference-in-differences design, two key requirements must be satisfied. First, before the shock for which the treatment effect is being estimated, the control and treatment groups should not differ significantly with respect to the outcome variables. This requirement is often expressed as the parallel trends identifying assumption in a difference-in-differences design. A second requirement to ensure internal validity of a difference-in-differences design is that the covariates must balance between the control and treatment groups (Atanasov and Black, 2016). Before examining the results of DiD tests, we study the validity of both these assumptions in our setting.

1.20 Baseline differences in outcomes before the shock

Figures 3 and 4 examine the validity of the first assumption. Figure 3 plots the kernel densities for the number of ID exits for the control and treatment groups from 2006 to 2008. The left panel uses governance violations as a proxy to separate the firms into control and treatment groups while the right panel uses earnings management to do the separation. For the distributions in both panels, the Kolmogorov-Smirnov tests for the equality of the distributions cannot reject the null hypothesis

that the distributions are identical. Figure 4 then plots the kernel densities for the percentage of IDs, percentage of expert IDs, number of board meetings held and ID attendance in the board meetings from 2006 to 2008. Again, for each of these distributions, the Kolmogorov-Smirnov tests cannot reject the null hypothesis that the distributions are identical. So, we can conclude from Figures 3 and 4 that the control and treatment groups do not differ significantly in the relevant outcome variables before the Satyam scandal.

1.21 Covariate balance between control and treatment groups

To examine the second assumption, in Figure 5, we plot the kernel densities for (i) volatility to capture the riskiness of a firm, (ii) the logarithm of sales to proxy for firm size and thereby capture additional risk associated with smaller firms, (iii) return on assets (ROA) to capture firm performance, (iv) debt-equity ratio to capture financial risk due to higher financial leverage, (v) promoter's shareholding as well as the percentage of promoter directors on the board to proxy firms that are owned and/or controlled by families. For volatility, promoter's shareholding, percentage of promoter directors on the board and debt-equity ratio, the Kolmogorov-Smirnov tests for the equality of the distributions cannot reject the null hypothesis that the distributions are identical across the control and treatment groups. However, we find the distributions for return on assets and firm size to be different between the control and treatment groups: the treatment firms are less profitable as measured using the ROA and are smaller than the control group of firms. The evidence that poorly performing firms are more likely to restate their earnings is consistent with the evidence in Defond and Jiambalvo (1991), who find the same phenomenon for the U.S. firms. As the covariates do not completely balance, we include these variables as controls in our difference-in-differences tests to account for the possibility that the treatment effect may stem from difference in the covariate variables. We now examine the results from the difference-in-differences tests.

1.22 Spillover effects on ID exits

Table 6 reports the results of the tests using ID exits as the outcome variable. We employ the specification as described in equation (1). In column 1, we use the Dummy for Governance Violation as the proxy for the treatment firm and find that the coefficient of interaction is positive and statistically significant at the 10% level. In column 2, we use high level of discretionary accruals, measured using the model in Kothari et al. (2005) to proxy the treatment firm and find again that the coefficient of interaction is positive and statistically significant at the 10% level. In columns 3 and 4, we employ earnings management proxies using the level of ROA and EPS respectively to proxy the treatment firm and find again that the coefficient of interaction is positive and statistically significant at the 10% level. Economically, when compared to the control group of firms, ID exits are 24%, 33% and 23% higher in the in treatment firms in columns 1, 2 and 4 respectively. In column 3, we find that ID exits in the control group of firms are negligible with the entire effect being centered on the treatment firms. Thus, across columns 1 to 4, we find that the number of ID exits increased relatively more in treatment firms than in control firms. Clearly,

these difference-in-differences estimates are large. Thus, the evidence in Table 6 is consistent with the hypotheses 5(i) and 6(i).

1.23 Spillover effects on board independence

In Table 7, we display the results of the difference-in-differences tests for the percentage of IDs. The regression specifications we employ in Table 7 are identical to those employed in Table 6. Using each of the four different measures to separate the firms into treatment and control groups as in Table 6, we find the coefficient of the interaction term to be negative and statistically significant at the 10% level or higher in columns 1-3. In Column 4, the coefficient is not statistically significant though the sign of the coefficient is positive and along expected lines.

Economically, in columns 1 and 2, the effect of the Satyam scandal is restricted to the treatment firms with the effect on control group of firms being negligible. In column 3, when compared to the control group of firms, the effect of the Satyam scandal on treatment firms is 225% higher. Clearly, these difference-in-differences estimates are large. Thus, across columns 1 to 3, we find that the effect of the scandal is felt disproportionately more by treatment firms than by control firms. Thus, the evidence in Table 7 is consistent with the hypotheses 5(ii) and 6(ii).

1.24 Spillover effects on percentage of expert IDs

In Table 8, we display the results of the difference-in-differences tests for the percentage of expert IDs. The regression specifications we employ in Table 8 are identical to those employed in Tables 6 and 7. Using each of the four different measures to separate the firms into treatment and control groups as in Tables 6 and 7, we find the coefficient of the interaction term to be negative and statistically significant at the 5% level or higher in each of the columns. Economically, the percentage of expert IDs decreased by 6.3%-12.7% more in treatment firms when compared to the control group of firms, which is large. Thus, the evidence in Table 8 is consistent with the hypotheses 5(iii) and 6(iii).

1.25 Spillover Effects on Monitoring by IDs

1.25.1 Spillover effects on frequency of board meetings

In Table 9, we display the results of the difference-in-differences tests for the frequency of board meetings. The regression specifications we employ in Table 9 are identical to those employed in Tables 6-8. Using each of the four different measures to separate the firms into treatment and control groups as in Tables 6-8, we find the coefficient of the interaction term to be positive and statistically significant at the 1% level in each of the columns. Economically, the frequency of board meetings increased by 14.7%-24.6% more in treatment firms when compared to the control group of firms; the effect is thus large. Thus, the evidence in Table 9 is consistent with the hypotheses 5(iv) and 6(iv).

1.25.2 Spillover effects on attendance of IDs in board meetings

In Table 10, we display the results of the difference-in-differences tests for the attendance of IDs in board meetings. The regression specifications we employ in Table 10 are identical to those

employed in Table 6-9. Using each of the four different measures to separate the firms into treatment and control groups as in Tables 6-9, we find the coefficient of the interaction term to be positive and statistically significant at the 1% level in each of the columns. Economically, the frequency of board meetings increased by 3.7%-4.8% more in treatment firms when compared to the control group of firms; the effect is thus meaningful. Thus, the evidence in Table 10 is consistent with the hypotheses 5(iv) and 6(iv).

Discussion

Our results so far highlight that when an accounting scandal increases the perceived risk of accounting manipulation in other firms, the spillover effects may be quite sharp. As argued before, the expected costs to an ID equal the probability of an adverse outcome multiplied by the reputational and legal liabilities incurred by the ID conditional on an adverse outcome. So, the magnitude of the spillover effects depends on: (i) the perceived likelihood of an adverse outcome; and (ii) the magnitude of the liability incurred by the ID. Our difference-in-differences tests exploited variation in (i) because the likelihood of an adverse outcome is higher in poorly performing firms when compared to well performing ones. Our results showing the large decrease in the percentage of expert IDs when compared to the nominal decrease in the percentage of all IDs exploited variation in (ii). This is because experts IDs face greater reputational liabilities from an adverse event.

Our results have implications for the intensity of spillovers in other settings. First, the depth of the D&O insurance market affects the intensity of the corporate governance spillovers. Directors and officers (D&O) insurance takes care of all out-of-pocket expenses of IDs (Black et al. (2006)). However, unlike in the U.S., the D&O insurance market is not well developed in many countries. In the absence of D&O insurance, any liabilities created by an adverse event have to be borne by the ID from his/her pocket. As a result, personal liabilities faced by IDs are higher in an environment where the D&O insurance market lacks depth. Therefore, our results imply that the intensity of corporate governance spillovers would be higher in countries where the D&O insurance market is not well developed.

Second, the intensity of the corporate governance spillovers depends on whether the IDs face civil and criminal liabilities or only face civil liabilities. In some countries, IDs only face civil liabilities when faced with an adverse event in the firm they are associated with. In contrast, in many emerging markets IDs face both civil and criminal liabilities (Cheffins et al. (2011)). Our results imply that the intensity of the corporate governance spillovers would be greater in countries where IDs face both civil and criminal liabilities when compared to countries where IDs face civil liabilities only.

Third, our results imply that as accounting scandals become more widespread across the world, their spillover effects may increase. This is because outside the U.S., both in common law and civil law countries, personal liabilities faced by IDs have been increasing, with some countries enacting legislation that imposes limits on the out-of-pocket penalties that IDs can be forced to pay (Cheffins et al. (2011)).

Finally, our results imply that intensity of the corporate governance spillovers may be greater in environments where market failures abound. In the developed markets, several market-based mechanisms—such as a potent market for corporate control, activist institutional investors—complement an ID in monitoring a firm’s insiders. Such monitoring mechanisms help to reduce the likelihood of adverse events in the firms with which the IDs are associated with. When such market-based mechanisms are weak or absent, IDs may have to face up to a high likelihood of insiders indulging in unscrupulous actions. Therefore, the spillovers may be more intense in such environments. As pointed out in Section 0, a wave of major accounting scandals in the U.S. at the turn of the century, did not appear to have produced a major exodus of IDs from other firms.

Conclusion

Increases in instances of accounting failures across the world necessitate an assessment of the overall costs and benefits engendered by such failures. Spillover effects on other firms, i.e. firms not involved in the scandal, constitute an important component of such costs and benefits. Our analysis suggests that policymakers should factor the spillover effects on other firms when debating legislative responses to accounting failures. While we have focused on the corporate governance spillovers, the external cost of capital faced by other firms may also be affected by an accounting failure in one firm. Similarly, monitoring through block holder ownership, analyst coverage and the market for corporate control may be other spillover effects caused by a prominent accounting failure in one firm. We suggest these as directions for future research.

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Figure 1: Exodus of Independent Directors from Indian listed firms Jul '07 to Jul '10

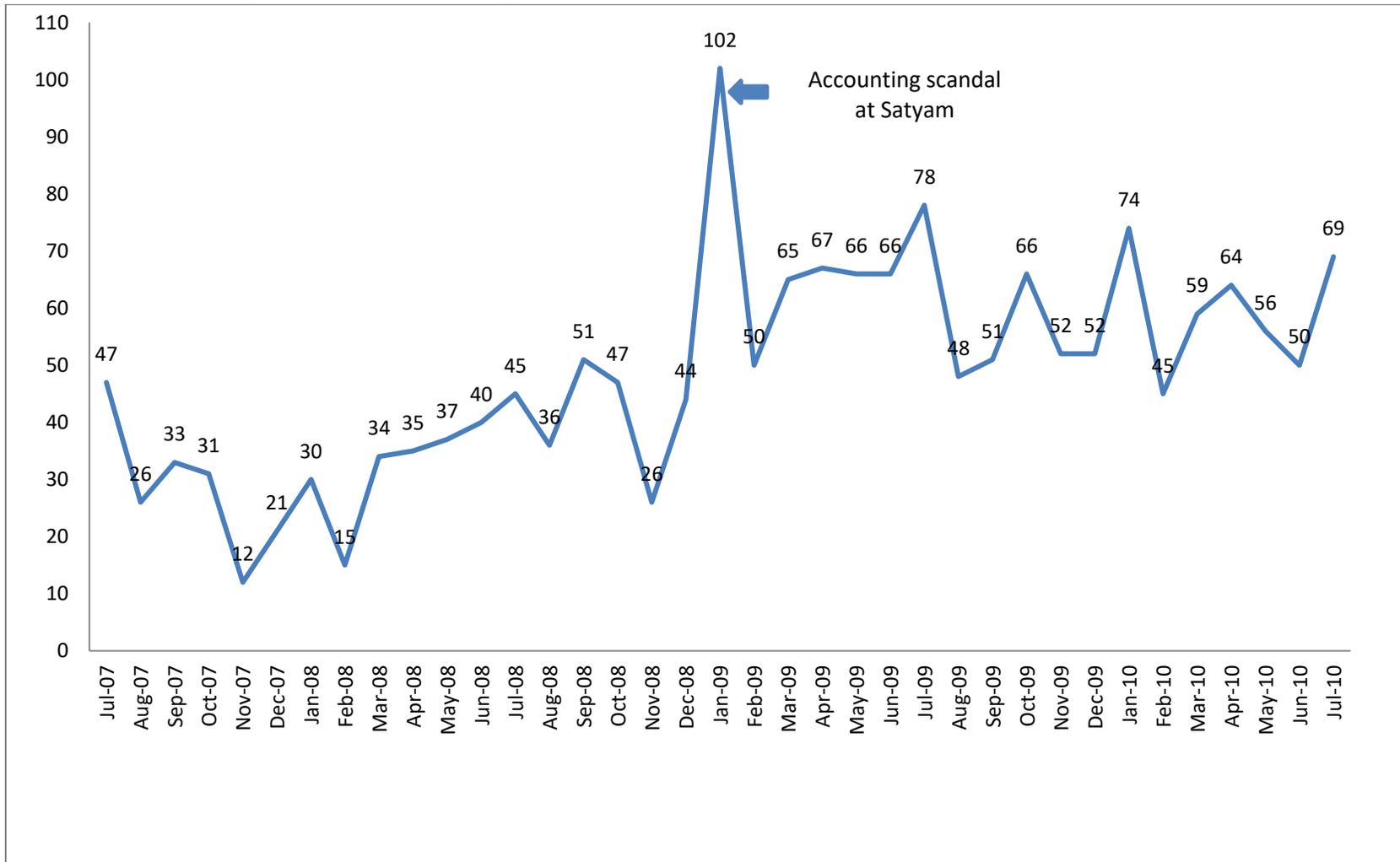


Figure 2: Review of the literature on accounting failures

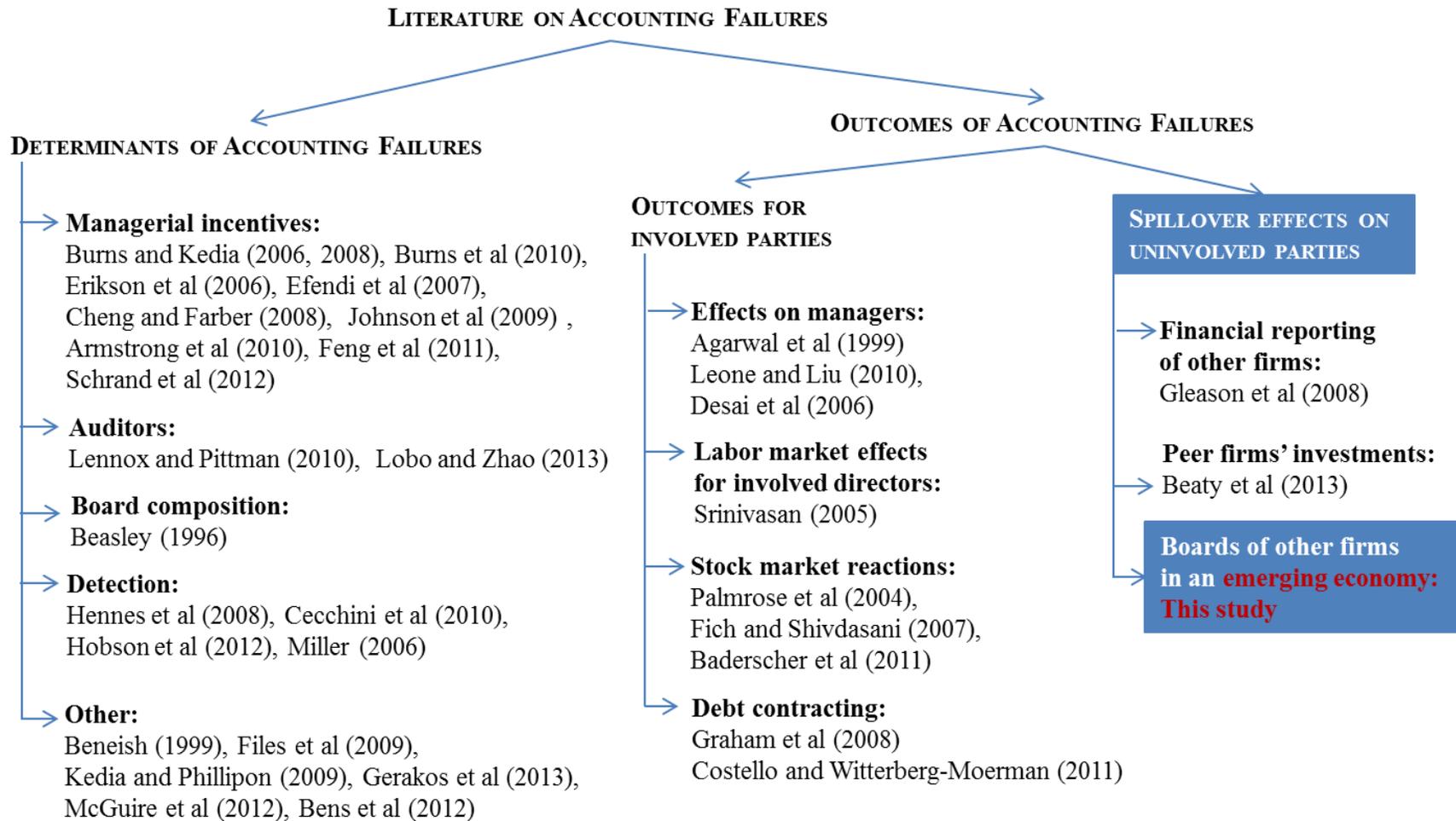


Figure 3: Baseline Density of ID Exits: Treatment versus Control Groups

This figure plots the Kernel density for the number of ID exits before 2008 for control and treatment groups. Governance violations (SEBI violation and/or BSE violation) and Earnings Management before 2008 are used to separate firms into treatment and control groups.

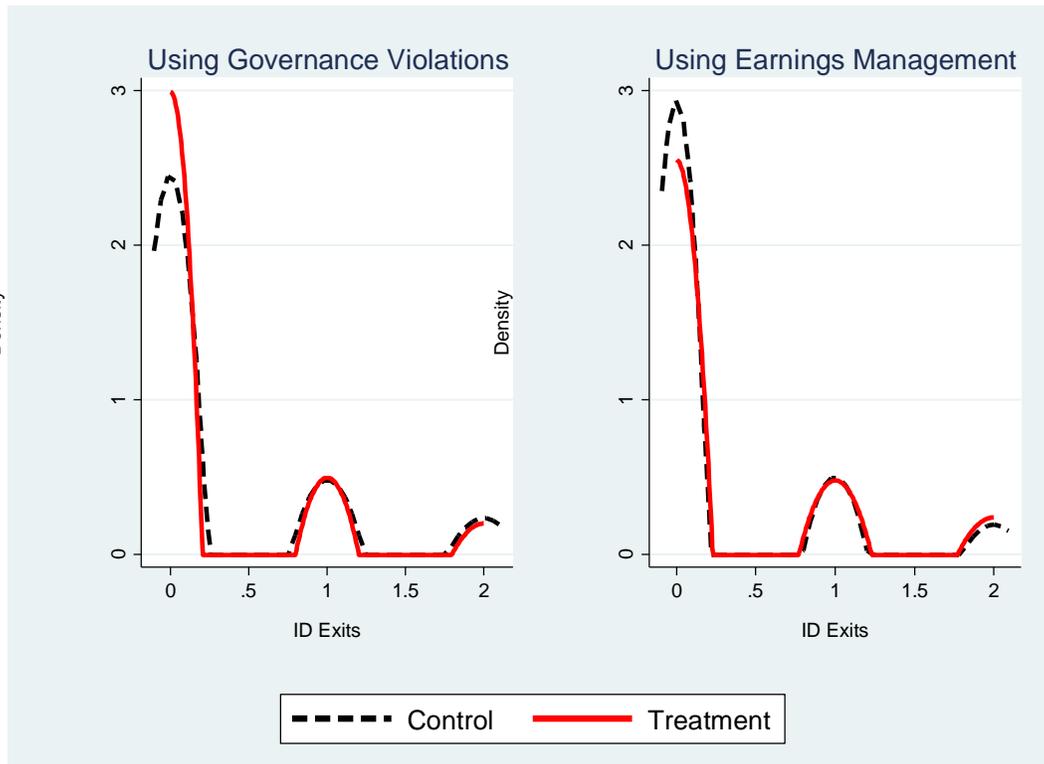


Figure 4: Baseline Density of Other Outcomes: Treatment versus Control Groups

This figure plots the Kernel density for all the other outcome variables (percentage of IDs on the board, percentage of expert IDs on the board, number of board meetings and average attendance of IDs in board meetings) before 2008 for control and treatment groups. Earnings Management before 2008 is used to separate firms into treatment and control groups. As the kernel density plots are similar using Governance violations (SEBI violation and/or BSE violation) before 2008 to separate firms into treatment and control groups, they are omitted for brevity.

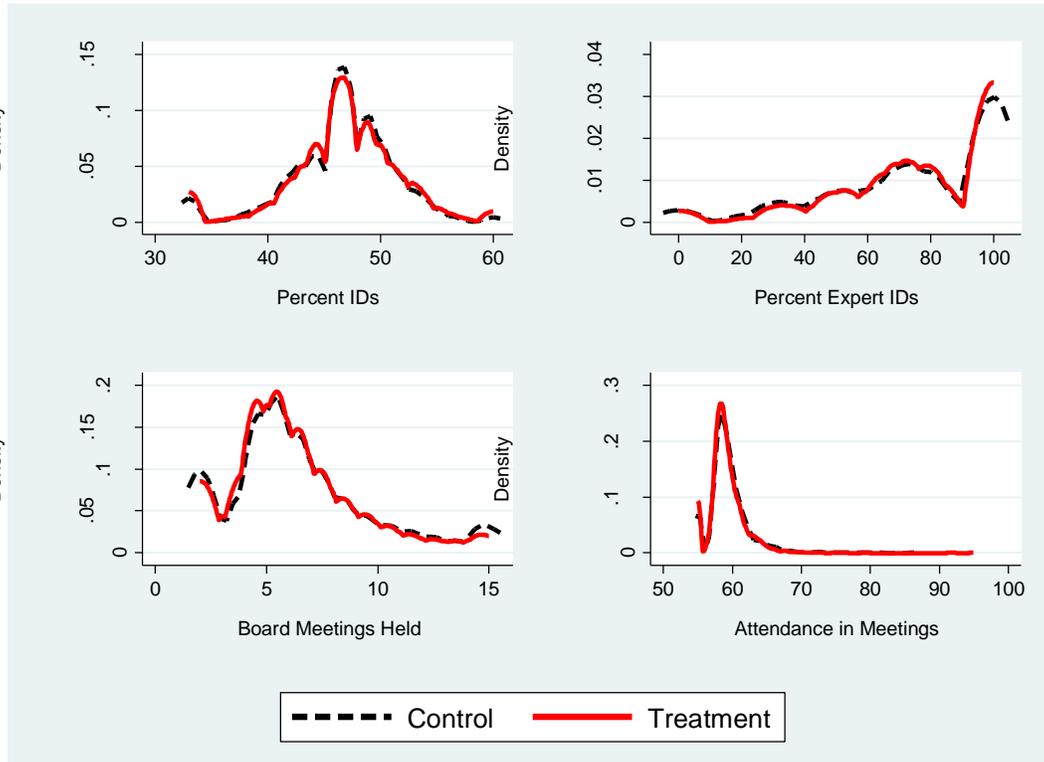


Figure 5: Covariate Balance at Baseline: Treatment versus Control Groups

This figure plots the Kernel density for all the covariates (volatility, firm size as proxied by log of sales, return on assets, percentage of firm shares held by the promoter, percentage of promoter directors on the board and debt to equity ratio) before 2008 for control and treatment groups. Earnings Management before 2008 is used to separate firms into treatment and control groups. As the kernel density plots are similar using Governance violations (SEBI violation and/or BSE violation) before 2008 to separate firms into treatment and control groups, they are omitted for brevity.

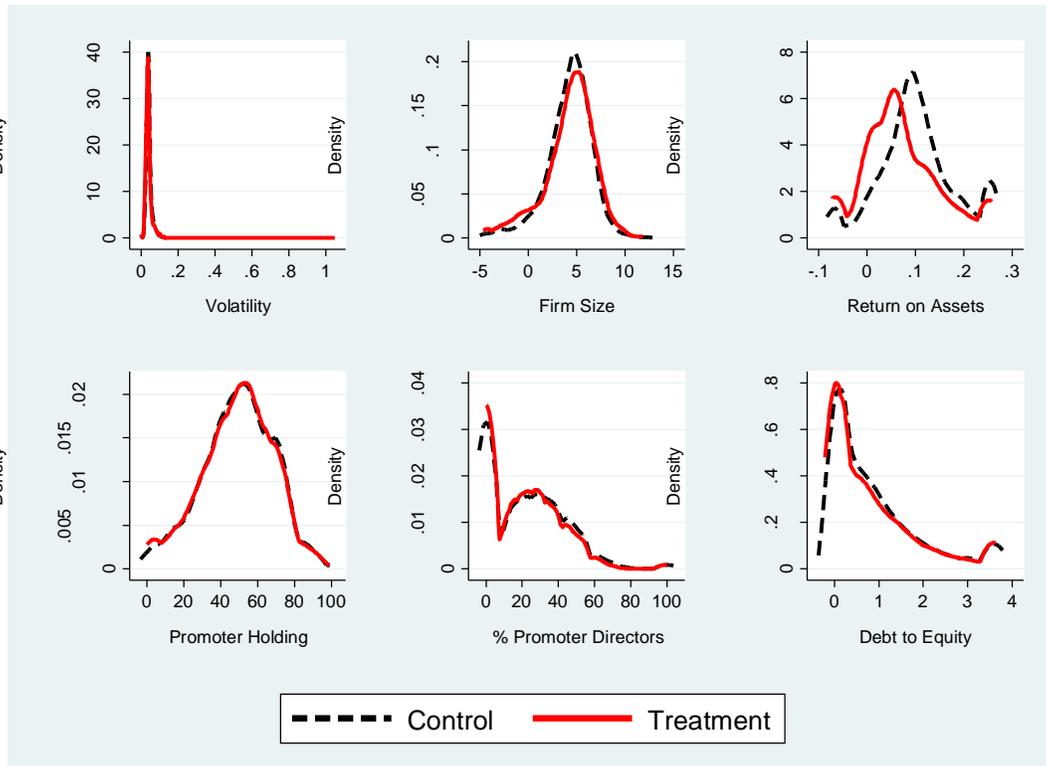


Table 1: Descriptive statistics

The Table shows the summary statistics for the variables used in our study. The sample consists of 2653 BSE-listed firms that complied with Clause 49. The sample covers the time period 2006-10. % of IDs equals the number of IDs divided by board size, ID exits equal the number of IDs that resigned, % expert IDs equals the number of expert IDs divided by board size, meetings held equal the number of board meetings held in a year, while average attendance of IDs equals the percentage of board meetings attended by IDs averaged across all the IDs on the board. Sales equal the sales revenue in INR millions, volatility is defined as the standard deviation of stock returns, return on assets equals net income by total assets, % promoters' holding equals the percentage of floating stock held by the promoter, % of promoter IDs equals the number of promoter IDs divided by board size and debt to equity ratio equals the book value of total long-term debt divided by the total net worth. Number of governance violations equal the violations booked against a firm by SEBI or BSE from the years 2006 to 2008. The dummy for high discretionary accruals equals 1 if the firm employs a high (above median) level of discretionary accruals and 0 otherwise, where discretionary accruals are measured using the model employed in Kothari et al. (2005). Following Burgstahler and Dichev (1997) and Degeorge, Patel and Zeckhauser (1999), Dummy for earnings management (ROA) equals 1 if a firm reports a small positive ROA, i.e. between 0% and 1% and 0 otherwise. Similarly, Dummy for earnings management (EPS) equals 1 if a firm reports a small positive EPS, i.e. between INR 0.01 and INR 0.25 and 0 otherwise. All the continuous variables are winsorized at the 95% level.

Variable	Obsns.	Mean	Median	Std. Dev.
Outcome variables:				
% IDs	13189	46.7	46.5	4.7
ID exits	13265	0.3	0.0	0.6
% Expert IDs	12840	65.1	66.7	30.5
Meetings held	13265	7.5	7.0	3.5
Average attendance of IDs (%)	12394	63.0	60.6	5.6
Control variables:				
Sales (INR million)	11404	994.6	110.4	7786.3
Volatility	11593	0.04	0.04	0.02
Return on assets (ROA in %)	12791	10%	10%	10%
% Promoters holding	12369	49.8	51.3	19.5
% Promoter Directors on the board	13265	20.1	16.7	19.4
Debt to equity ratio	12792	0.9	0.5	1.0
Variables used to separate into treatment and control groups using values as of 2008:				
Governance violations (SEBI or BSE)	2653	0.6	1.0	0.5
Dummy for high discretionary accruals	2653	0.5	0.0	0.5

Dummy for earnings management (ROA)	2529	0.3	0.0	0.6
Dummy for earnings management (EPS)	2529	0.2	0.0	0.6

Table 2: Spillover Effects of an Accounting Scandal on ID Exits and Board Independence

This Table shows the effect of an accounting scandal in India on the ID exits from Indian boards (Panel A) and percentage of IDs on Indian boards (Panel B). Column 1 shows the effect on the ID exits while column 2 shows the effect on exits by ID exits normalized by the size of the board. Columns 3-5 shows the effect on percent of IDs on the board. Column 3 shows the results using the full sample (2006 – 2010), Column 4 and 5 show the results using sample periods 2008 – 2010 and 2007 – 2008, respectively. Dummy for Post Accounting Scandal equals one for $t \geq 2009$ and equals zero for $t < 2009$. Dummy for Start of Financial Crisis equals one for $t = 2008$ and zero for $t = 2007$. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	ID Exits	ID Exits	ID Exits / Board Size	% IDs	% IDs	% IDs
Sample:	2006-10	2006-10	2006-10	2006-10	2008-10	2007-08
	(1)	(2)	(3)	(4)	(5)	(6)
Dummy for Post Accounting Scandal	0.172*** (0.012)	0.125*** (0.015)	0.018*** (0.002)	-0.354*** (0.063)	-0.341*** (0.066)	
Dummy for Start of Financial Crisis						0.046 (0.073)
Volatility		-0.423 (0.358)	-0.056 (0.048)	1.249 (2.086)	10.327** (4.661)	10.312 (7.192)
Firm Size (Log of Sales)		-0.006 (0.012)	-0.002 (0.002)	0.051 (0.072)	-0.035 (0.093)	-0.026 (0.106)
Return on assets		-0.635*** (0.157)	-0.070*** (0.019)	-0.774 (0.651)	-0.775 (0.796)	-2.906* (1.509)
Promoters holding (%)		-0.001 (0.001)	-0.000 (0.000)	-0.006 (0.007)	-0.014 (0.009)	-0.005 (0.023)
Promoter Directors on Board (%)		-0.017*** (0.002)	-0.002*** (0.000)	-0.103*** (0.011)	-0.065*** (0.014)	-0.172*** (0.022)
Debt to Equity ratio		0.001**	0.000*	0.001	0.000	0.003

Constant	0.269*** (0.005)	0.821*** (0.096)	0.096*** (0.012)	49.265*** (0.541)	48.949*** (0.774)	50.793*** (1.269)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,265	9,899	9,899	9,880	6,109	4,036
R ²	0.332	0.361	0.331	0.845	0.905	0.951

Table 3: Spillover Effects of an Accounting Scandal on the Percentage of Expert IDs on Boards

The Table shows the effect of an accounting scandal in India on the percentage of expert IDs on Indian corporate boards. We label a director an expert by searching for his educational qualifications as well as his occupation: a director is defined as an expert if (s)he is a civil servant, possesses a business or a law degree, and is a practicing lawyer, PhD or academic. Columns 1-2 show the results using the full sample (2006 – 2010), and Columns 3 and 4 show the results using sample periods 2008 – 2010 and 2007 – 2008, respectively. Dummy for Post Accounting Scandal equals one for $t \geq 2009$ and equals zero for $t < 2009$. Dummy for Start of Financial Crisis equals one for $t = 2008$ and zero for $t = 2007$. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	% Expert IDs			
Sample:	2006-10	2008-10	2007-08	
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal	-26.865*** (0.392)	-28.289*** (0.418)	-28.421*** (0.511)	
Dummy for Start of Financial Crisis				0.302 (0.310)
Volatility		22.343 (14.486)	66.152* (37.602)	15.880 (28.868)
Firm Size (Log of Sales)		1.159*** (0.410)	2.615*** (0.683)	-0.081 (0.599)
Return on assets		35.041*** (3.709)	54.503*** (5.939)	4.016 (5.734)
Promoters holding (%)		0.022 (0.038)	-0.015 (0.062)	0.025 (0.064)
Promoter Directors on Board (%)		0.024 (0.056)	0.055 (0.079)	-0.137 (0.115)
Debt to Equity ratio		-0.006 (0.006)	0.001 (0.006)	0.092 (0.085)
Constant	76.219*** (0.162)	65.611*** (2.944)	56.788*** (4.757)	77.449*** (4.637)
Firm FE	Yes	Yes	Yes	Yes
Observations	12,840	9,785	6,085	3,975
R ²	0.856	0.882	0.895	0.975

Table 4: Spillover Effects of an Accounting Scandal on the Number of Board Meetings Held

The Table shows the effect of an accounting scandal in India on the number of board meetings held. Columns 1-2 show the results using the full sample (2006 – 2010), and Columns 3 and 4 show the results using sample periods 2008 – 2010 and 2007 – 2008, respectively. Dummy for Post Accounting Scandal equals one for $t \geq 2009$ and equals zero for $t < 2009$. Dummy for Start of Financial Crisis equals one for $t = 2008$ and zero for $t = 2007$. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	Number of board meetings held			
Sample:	2006-10	2006-10	2008-10	2007-08
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal	2.946*** (0.057)	2.842*** (0.065)	2.776*** (0.086)	
Dummy for Start of Financial Crisis				-0.076 (0.092)
Volatility		-8.382* (4.969)	-12.222* (6.583)	8.016 (11.228)
Firm Size (Log of Sales)		-0.087 (0.061)	-0.343*** (0.112)	-0.008 (0.179)
Return on assets		-3.374*** (0.598)	-6.883*** (0.977)	1.806 (1.452)
Promoters holding (%)		0.006 (0.006)	0.015 (0.010)	-0.003 (0.014)
Promoter Directors on Board (%)		0.001 (0.006)	0.007 (0.010)	-0.011 (0.017)
Debt to Equity ratio		-0.000 (0.001)	-0.001 (0.001)	-0.001 (0.004)
Constant	6.314*** (0.023)	7.265*** (0.457)	8.389*** (0.753)	6.645*** (1.143)
Firm FE	Yes	Yes	Yes	Yes
Observations	13,265	9,899	6,113	4,042
R ²	0.586	0.661	0.736	0.818

Table 5: Spillover Effects of an Accounting Scandal on the Average Attendance of IDs on Boards

The Table shows the effect of an accounting scandal in India on the average attendance of IDs on Indian corporate boards. Columns 1-2 show the results using the full sample (2006 – 2010), and Columns 3 and 4 show the results using sample periods 2008 – 2010 and 2007 – 2008, respectively. Dummy for Post Accounting Scandal equals one for $t \geq 2009$ and equals zero for $t < 2009$. Dummy for Start of Financial Crisis equals one for $t = 2008$ and zero for $t = 2007$. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	Average attendance of IDs			
	2006-10	2006-10	2008-10	2007-08
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal	9.403*** (0.064)	9.283*** (0.072)	9.200*** (0.095)	
Dummy for Start of Financial Crisis				-0.055 (0.070)
Volatility		-8.532 (5.320)	-14.326* (7.469)	7.539 (9.452)
Firm Size (Log of Sales)		-0.061 (0.059)	-0.231** (0.109)	0.131 (0.112)
Return on assets		-2.497*** (0.595)	-5.513*** (1.052)	0.812 (1.105)
Promoters holding (%)		0.005 (0.006)	0.011 (0.010)	0.005 (0.010)
Promoter Directors on Board (%)		0.009 (0.007)	0.026** (0.012)	-0.008 (0.011)
Debt to Equity ratio		-0.001 (0.001)	-0.001 (0.001)	0.000 (0.004)
Constant	59.286*** (0.026)	59.722*** (0.469)	60.511*** (0.792)	58.474*** (0.870)
Firm FE	Yes	Yes	Yes	Yes
Observations	12,394	9,731	6,052	3,993
R ²	0.853	0.879	0.885	0.866

Table 6: Spillover Effects on ID Exits: Difference-in-differences Tests

The Table shows the results of difference-in-differences tests for the effect of an accounting scandal in India on ID exits. The sample is from 2006 to 2010. Dummy for Post Accounting Scandal equals 1 for $t \geq 2009$ and 0 for $t < 2009$. Dummy for Governance violation equals 1 if the firm was booked for a violation by either SEBI or BSE in any year from 2006-08. High discretionary accruals is a dummy that equals one if the firm ranked above the median on the level of discretionary accruals measured using the model of Kothari et al. (2005). Dummy for earnings management (ROA) and Dummy for earnings management (EPS) denote earnings management captured by low positive levels of ROA and EPS respectively. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	ID Exits			
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal *	0.028*			
Dummy for Governance Violation	(0.015)			
Dummy for Post Accounting Scandal *		0.126*		
Dummy for High discretionary accruals		(0.051)		
Dummy for Post Accounting Scandal *			0.039*	
Dummy for Earnings management (ROA)			(0.016)	
Dummy for Post Accounting Scandal *				0.029*
Dummy for Earnings management (EPS)				(0.011)
Dummy for Post Accounting Scandal	0.116**	0.069	0.119***	0.124***
	(0.033)	(0.046)	(0.023)	(0.024)
Dummy for Governance Violation	-0.038*			
	(0.018)			
Dummy for High discretionary accruals		0.001		
		(0.004)		
Dummy for Earnings management (ROA)			-0.018	
			(0.015)	
Dummy for Earnings management (EPS)				0.002
				(0.014)
Volatility	-0.965**	-0.883**	-0.996**	-1.012**
	(0.249)	(0.204)	(0.288)	(0.319)
Firm Size (Log of Sales)	0.038***	0.040***	0.039***	0.040***
	(0.002)	(0.002)	(0.003)	(0.003)
Return on assets	-0.874*	-0.744*	-0.864*	-0.851*
	(0.334)	(0.336)	(0.327)	(0.330)
Promoters holding (%)	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)

Promoter Directors on Board (%)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)
Debt to Equity ratio	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Constant	0.406*** (0.052)	0.361*** (0.036)	0.395*** (0.052)	0.384*** (0.049)
Observations	13,265	13,265	13,265	13,265
R ²	0.344	0.337	0.338	0.337

Table 7: Spillover Effects on Board Independence: Difference-in-differences Tests

The Table shows the results of difference-in-differences tests for the effect of an accounting scandal in India on the percentage of IDs. The sample is from 2006 to 2010. Dummy for Post Accounting Scandal equals 1 for $t \geq 2009$ and 0 for $t < 2009$. Dummy for Governance violation equals 1 if the firm was booked for a violation by either SEBI or BSE in any year from 2006-08. High discretionary accruals is a dummy that equals one if the firm ranked above the median on the level of discretionary accruals measured using the model of Kothari et al. (2005). Dummy for earnings management (ROA) and Dummy for earnings management (EPS) denote earnings management captured by low positive levels of ROA and EPS respectively. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	Percentage of IDs on Boards			
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal *	-0.352***			
Dummy for Governance Violation	(0.126)			
Dummy for Post Accounting Scandal *		-0.225*		
Dummy for High discretionary accruals		(0.129)		
Dummy for Post Accounting Scandal *			-0.293**	
Dummy for Earnings management (ROA)			(0.137)	
Dummy for Post Accounting Scandal *				-0.016
Dummy for Earnings management (EPS)				(0.173)
Dummy for Post Accounting Scandal	-0.049	-0.116	-0.130*	-0.204***
	(0.082)	(0.087)	(0.074)	(0.070)
Dummy for Governance Violation	-0.271			
	(0.166)			
Dummy for High discretionary accruals		-0.043		
		(0.067)		
Dummy for Earnings management (ROA)			-0.045	
			(0.167)	
Dummy for Earnings management (EPS)				-0.274
				(0.196)
Volatility	3.116	2.740	2.132	2.647
	(2.723)	(2.725)	(2.721)	(2.726)
Firm Size (Log of Sales)	0.070*	0.082**	0.077**	0.067*
	(0.036)	(0.036)	(0.037)	(0.037)
Return on assets	-1.688*	-1.725*	-1.630*	-1.620*
	(0.883)	(0.895)	(0.889)	(0.885)
Promoters holding (%)	-0.020***	-0.019***	-0.020***	-0.021***
	(0.004)	(0.004)	(0.004)	(0.004)

Promoter Directors on Board (%)	-0.039*** (0.005)	-0.039*** (0.005)	-0.038*** (0.005)	-0.038*** (0.005)
Debt to Equity ratio	0.005*** (0.002)	0.006*** (0.002)	0.006*** (0.002)	0.006*** (0.002)
Constant	48.695*** (0.367)	48.460*** (0.357)	48.540*** (0.364)	48.634*** (0.367)
Observations	9,880	9,880	9,656	9,656
R ²	0.045	0.042	0.042	0.043

Table 8: Spillover Effects on Percentage of Expert IDs on Boards: Difference-in-differences Tests

The Table shows the results of difference-in-differences tests for the effect of an accounting scandal in India on the percentage of expert IDs. The sample is from 2006 to 2010. Dummy for Post Accounting Scandal equals 1 for $t \geq 2009$ and 0 for $t < 2009$. Dummy for Governance violation equals 1 if the firm was booked for a violation by either SEBI or BSE in any year from 2006-08. High discretionary accruals is a dummy that equals one if the firm ranked above the median on the level of discretionary accruals measured using the model of Kothari et al. (2005). Dummy for earnings management (ROA) and Dummy for earnings management (EPS) denote earnings management captured by low positive levels of ROA and EPS respectively. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	Percentage of Expert IDs on Boards			
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal *	-1.879**			
Dummy for Governance Violation	(0.806)			
Dummy for Post Accounting Scandal *		-2.185***		
Dummy for High discretionary accruals		(0.847)		
Dummy for Post Accounting Scandal *			-3.511***	
Dummy for Earnings management (ROA)			(0.738)	
Dummy for Post Accounting Scandal *				-1.786**
Dummy for Earnings management (EPS)				(0.893)
Dummy for Governance Violation	-27.584***	-27.461***	-27.599***	-28.239***
	(0.570)	(0.604)	(0.485)	(0.456)
Dummy for High discretionary accruals	-1.987*			
	(1.119)			
Dummy for Earnings management (ROA)		-0.142		
		(0.402)		
Dummy for Earnings management (EPS)			1.406	
			(1.072)	
Dummy for Post Accounting Scandal				0.229
				(1.247)
Volatility	-21.796	-25.148	-28.645	-27.248
	(18.296)	(19.148)	(19.896)	(19.844)
Firm Size (Log of Sales)	0.873***	0.949***	0.939***	0.921***
	(0.211)	(0.209)	(0.213)	(0.219)
Promoters holding (%)	32.435***	31.533***	33.636***	33.275***
	(5.360)	(5.422)	(5.388)	(5.340)
Promoter Directors on Board (%)	0.096***	0.102***	0.104***	0.102***

	(0.026)	(0.026)	(0.026)	(0.026)
Debt to Equity ratio	-0.013	-0.009	-0.007	-0.007
	(0.029)	(0.029)	(0.029)	(0.029)
Promoters holding (%)	-0.008	-0.005	-0.006	-0.006
	(0.011)	(0.011)	(0.011)	(0.011)
Constant	67.099***	65.554***	65.027***	65.529***
	(2.100)	(1.995)	(2.052)	(2.079)
Observations	9,785	9,785	9,565	9,565
R ²	0.257	0.255	0.258	0.257

Table 9: Spillover Effects on the Number of Board Meetings Held: Difference-in-differences Tests

The Table shows the results of difference-in-differences tests for the effect of an accounting scandal in India on the number of board meetings held in a year. The sample is from 2006 to 2010. Dummy for Post Accounting Scandal equals 1 for $t \geq 2009$ and 0 for $t < 2009$. Dummy for Governance violation equals 1 if the firm was booked for a violation by either SEBI or BSE in any year from 2006-08. High discretionary accruals is a dummy that equals one if the firm ranked above the median on the level of discretionary accruals measured using the model of Kothari et al. (2005). Dummy for earnings management (ROA) and Dummy for earnings management (EPS) denote earnings management captured by low positive levels of ROA and EPS respectively. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	Number of Board Meetings Held			
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal *	0.393***			
Dummy for Governance Violation	(0.110)			
Dummy for Post Accounting Scandal *		0.628***		
Dummy for High discretionary accruals		(0.097)		
Dummy for Post Accounting Scandal *			0.415***	
Dummy for Earnings management (ROA)			(0.086)	
Dummy for Post Accounting Scandal *				0.457***
Dummy for Earnings management (EPS)				(0.088)
Dummy for Post Accounting Scandal	2.658***	2.556***	2.733***	2.760***
	(0.081)	(0.078)	(0.066)	(0.062)
Dummy for Governance Violation	0.140			
	(0.105)			
Dummy for High discretionary accruals		-0.074		
		(0.071)		
Dummy for Earnings management (ROA)			0.031	
			(0.093)	
Dummy for Earnings management (EPS)				-0.084
				(0.098)
Volatility	0.266	0.787	0.751	1.223
	(1.848)	(2.000)	(2.042)	(2.173)
Firm Size (Log of Sales)	0.073***	0.065***	0.059***	0.062***
	(0.019)	(0.019)	(0.020)	(0.020)
Return on assets	-4.376***	-3.881***	-4.385***	-4.587***
	(0.509)	(0.516)	(0.512)	(0.514)
Promoters holding (%)	-0.012***	-0.012***	-0.012***	-0.012***

	(0.002)	(0.002)	(0.003)	(0.003)
Promoter Directors on Board (%)	-0.007***	-0.007***	-0.007***	-0.007***
	(0.003)	(0.003)	(0.003)	(0.003)
Debt to Equity ratio	0.001	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	7.225***	7.304***	7.352***	7.366***
	(0.194)	(0.181)	(0.192)	(0.199)
Observations	9,899	9,899	9,669	9,669
R ²	0.217	0.217	0.215	0.214

Table 10: Spillover Effects on Average Attendance of IDs on Boards: Difference-in-differences Tests

The Table shows the results of difference-in-differences tests for the effect of an accounting scandal in India on the average annual attendance of IDs on boards. The sample is from 2006 to 2010. Dummy for Post Accounting Scandal equals 1 for $t \geq 2009$ and 0 for $t < 2009$. Dummy for Governance violation equals 1 if the firm was booked for a violation by either SEBI or BSE in any year from 2006-08. High discretionary accruals is a dummy that equals one if the firm ranked above the median on the level of discretionary accruals measured using the model of Kothari et al. (2005). Dummy for earnings management (ROA) and Dummy for earnings management (EPS) denote earnings management captured by low positive levels of ROA and EPS respectively. Standard errors reported in parentheses are robust to heteroskedasticity and are *clustered by firm*. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Dependent variable:	Average Attendance of IDs on Boards			
	(1)	(2)	(3)	(4)
Dummy for Post Accounting Scandal *	0.365***			
Dummy for Governance Violation	(0.125)			
Dummy for Post Accounting Scandal *		0.383***		
Dummy for High discretionary accruals		(0.116)		
Dummy for Post Accounting Scandal *			0.441***	
Dummy for Earnings management (ROA)			(0.085)	
Dummy for Post Accounting Scandal *				0.345***
Dummy for Earnings management (EPS)				(0.103)
Dummy for Post Accounting Scandal	9.133***	9.138***	9.183***	9.239***
	(0.089)	(0.095)	(0.076)	(0.072)
Dummy for Governance Violation	0.178*			
	(0.093)			
Dummy for High discretionary accruals		-0.163***		
		(0.058)		
Dummy for Earnings management (ROA)			-0.044	
			(0.078)	
Dummy for Earnings management (EPS)				-0.106
				(0.089)
Volatility	0.734	1.016	1.576	1.833
	(1.892)	(1.987)	(2.194)	(2.269)
Firm Size (Log of Sales)	-0.019	-0.028	-0.029	-0.030
	(0.019)	(0.018)	(0.019)	(0.020)
Return on assets	-3.165***	-2.934***	-3.231***	-3.391***
	(0.520)	(0.516)	(0.525)	(0.526)
Promoters holding (%)	-0.008***	-0.009***	-0.009***	-0.009***

	(0.003)	(0.002)	(0.003)	(0.003)
Promoter Directors on Board (%)	0.001	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Debt to Equity ratio	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	59.946***	60.085***	60.084***	60.104***
	(0.196)	(0.178)	(0.193)	(0.198)
Observations	9,731	9,731	9,510	9,510
R ²	0.708	0.707	0.706	0.706

