Deterrence for Independent Directors and Corporate Boards: Evidence from a Natural Experiment

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Abstract

We study the effect of the personal liabilities faced/perceived by independent directors (IDs) on ID entry and exit decisions, board composition and monitoring. Since Directors and Officers insurance changes with the risk of personal liabilities, studying this question is difficult. We examine this question using an unexpected, high-profile corporate governance (CG) failure in India, which increased the risk of personal liability. We find that, in contrast to CG failures in the U.S. in 2001, IDs exited in large numbers thereby decreasing the percentage and quality of IDs on boards. On the flipside, the increased deterrence stemming from greater risk of personal liability enhanced ID monitoring.

Key Words: Board of Directors, Corporate Governance Failure, Executive Directors, Independent Directors, Internal Governance

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1. Introduction

> "In January 2005, settlements were announced in two important cases – Enron and WorldCom. The terms of the settlements were unusual. They involved the directors of the companies making some payments out of their own pockets. Richard Breeden, former SEC chair, called these settlements a "watershed development" that will send a shudder through boardrooms across America and could change the rules of the game. While there is a substantial agreement that these developments could considerably change the rules of the game, there is considerable disagreement as to whether such a change would be positive or negative."
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> - Lucian Bebchuk in Bebchuk et. al. (2006) [1]

Recent developments in the U.S. have served to increase the *personal* liability faced/perceived by independent directors (IDs). In line with the quote above, in Dec 2010, the FDIC authorized lawsuits against several outside directors of failed financial institutions for simple or gross negligence.[3] In fact, according to Bainbridge (2009), "efforts to hold directors accountable for risk management failures during the financial crisis threaten to morph into holding directors liable for bad business outcomes." On the one hand, the deterrence created by an increase in the risk of personal liability should engender greater ID vigilance, reduce instances of IDs being found "asleep at the wheel" and thereby improve the quality of monitoring by IDs. Along these lines, Steve Cutler, Director, SEC Division of Enforcement, voiced the view that "a recurrence of the corporate abuses that led to the adoption of Sarbanes-Oxley Act could be prevented by creating more *personal* accountability and deterrence (for directors) *above and beyond that covered by D&O insurance*" (emphasis added).[4] On the other hand, an increase in the risk of personal liability may alter the cost-benefit trade-off faced by IDs and possibly lower the number and quality of IDs on corporate boards and increase the cost of hiring ID services. The net effect remains an empirical question.

The deterrence effect that the rise in personal liability seeks to achieve, however, is the product of two components – the actual risk of a firm experiencing a problem; and the extent of personal liability of independent directors that gets triggered in the case of the problem. Any empirical analysis of the impact of deterrence caused by raised stakes for IDs, therefore, can only hope to look at changes

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[1] For details, see "Ex-WorldCom Directors to pay $18 Million from Personal Assets" and "Former Enron Directors to pay $13 Million From Personal Funds," Corporate Accountability Report, 30(2), Jan 14, 2005.

[3] See http://www.dandodiary.com/2011/08/articles/failed-banks/potential-liabilities-of-former-directors-of-failed-banks/ for example.

[4] A similar argument has been made by Alan Hevesi, New York State comptroller and trustee of its Common Retirement Fund - the lead plaintiff in the WorldCom case - was quoted as saying, "(it) would be unfair and not a deterrent for future failures on the part of directors if they weren't held *personally liable*. The notion that companies can commit fraud and that the directors can ignore that and be *covered by insurance is just wrong*."

associated with a variation in the level of deterrence. As for personal liability *per se* investigating the effect of an increase in it presents empirical challenges, particularly in developed markets, where Directors and Officers (D&O) insurance protects IDs against personal liability. Empirical evidence suggests that D&O insurance responds endogenously to differences in personal liabilities faced by IDs. Chalmers *et al.* (2002) find that managers purchase D&O insurance to protect themselves against the personal liability stemming from their opportunistic behavior. Core (1997, 2000) finds that firms with greater litigation risk and distress probability are more likely to purchase D&O insurance. Linck et. al. (2008) find that post the wave of corporate governance (CG) failures in 2001 and the enactment of the Sarbanes-Oxley Act, D&O insurance premiums have doubled. Such endogenous changes in liabilities covered by D&O insurance – both in the cross-section and time-series – makes it difficult to assess the effects of changes in risk of personal liability engendered by any adverse event at the firm/economy level in developed markets. There are also additional losses for IDs in the event of a corporate crisis – reputational loss being the most obvious – that are neither covered by D&O insurance, nor are likely to be altered by legislated changes in personal liability.

In this paper, therefore, we study the effect of an increase in the deterrence on: (i) individual ID's exit and entry decisions, on the one hand, and monitoring by IDs, on the other hand; and (ii) composition of and monitoring by boards across firms in an economy; by looking at a situation when the perceived likelihood of a corporate scandal increased without any change in the personal liability for IDs.

We, therefore, employ a natural experiment in a key emerging market, India – a country with scant D&O insurance – to examine the effects of an increase in the risk of personal liability. In a national-level corporate scandal in January 2009, the promoter-chairman of the fourth largest Indian software firm, Satyam Computers, quite unexpectedly confessed to a long-standing accounting fraud in collusion with the firm's auditor – Price Waterhouse Coopers. Given Satyam's stellar CG record and reputation (with ADRs actively trading at the NASDAQ), as well as the Big Four stature of PwC the scandal completely shook corporate India's confidence in a key pillar of corporate governance, the auditors, significantly shifted priors about the likelihood of the management of an Indian firm

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indulging in such malpractices. As a result of this increase in deterrence, IDs resigned en masse from *other* firms (see Figure 1).

**** Insert Figure 1 here ****

We examine the effect of this increase in deterrence for IDs on board composition, director compensation and board monitoring in other Indian firms. We use a *unique*, hand-collected dataset of individual director and board characteristics for more than 2,500 Indian publicly listed firms. Our results are summarized as follows. We find that: (i) IDs exited in large numbers from other Indian firms thereby reducing the percentage of IDs on boards; (ii) the drop was *disproportionately* more in firms that were performing poorly or had higher accruals *a priori,* which is consistent with the argument that IDs perceived risk of personal liability to be greater in such firms; (iii) the percentage of expert IDs, as measured by their educational qualifications and professional experience, declined; (iii) director compensation, in particular fixed compensation, increased, which suggests that the cost of directorial services increased due to the increase in risk perceptions. We also find that the number of board meetings held per year as well as the attendance at the board meetings increased, which is consistent with greater vigilance by those IDs that stayed. Consistent with the firm substituting monitoring by IDs through other channels, we find that: (i) board size increased due to the increased appointment of executive directors (EDs), particularly those who are experts; (ii) the percentage of firms where the CEO held the job of the board chairman as well decreased; and (iii) the percentage of directors belonging to the promoter family decreased.

Thus, the increase in ID deterrence, boards in India shifted to a new equilibrium – an equilibrium where the exit of IDs, particularly the expert ones, and the resultant decrease in board independence was offset by the combination of: (i) increased monitoring by those IDs that continued on ID positions; and (ii) substitution of ID monitoring through other channels.

Our study makes the following contributions. First, ours is the first study to examine the effect of deterrence for IDs on the entry and exit decisions of IDs, board composition, ID remuneration and board monitoring. In particular, we throw light on the trade-off involved in deciding the optimal level of liability to impose on IDs by highlighting both the costs and benefits of such a move. As mentioned

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above, many institutional investors and policymakers in the U.S. are advocating an increase in *personal* liability imposed on IDs, i.e. liability that cannot be covered by D&O insurance. Given the presence of D&O insurance contracts that currently take care of all categories of major liabilities imposed on IDs, it may be difficult to generate this counterfactual to study the potential effects of a policy change that increases the *personal* liability imposed on IDs. Fortuitously, the Indian setting where IDs face significant personal liability – including potential criminal liability – provided the ideal setting to conduct this counterfactual experiment. Our evidence that IDs vote with their feet post a perceived increase in deterrence cautions against such a policy change in the U.S. At the same time, the evidence also suggests that those IDs that decide to continue on ID positions would monitor more diligently post an increase in personal liability.

Second, we complement prior studies by identifying using a natural experiment the effect of penalties suffered by IDs on their subsequent labor market outcomes. Prior studies have examined the effect of reputational penalties suffered by IDs due to an adverse event in the firms the IDs are associated with on IDs' labor market outcomes. These studies measure such outcomes using the change in directorships in other firms. The adverse event examined in these studies include financial fraud (Agrawal, Jaffe, and Karpoff (1999), Helland (2006), Fich and Shivdasani (2007)), earnings restatement (Srinivasan, 2005), bankruptcy (Gilson, 1990), and liquidation (Harford, 2003). Any increase or decrease in the ID positions of the involved IDs due to an adverse event results from an inextricable mix of two factors. First, following such an event, the involved ID may reconsider the costs and benefits of continuing as an ID on a particular firm. Second, the adverse event may lead to a reassessment of the ID's abilities, which make the ID potentially more or less attractive to a particular firm depending on the firm's preference for the revealed characteristics of the ID. Given such unobserved firm and ID characteristics that may affect the demand for the involved IDs after such an event, it is not surprising that the evidence on the effect of such events on IDs' labor market outcomes diverges considerably across studies. Srinivasan (2005) and Agrawal, Jaffe, and Karpoff (1999) find small or no changes; Gilson (1990) and Fich and Shivdasani (2007) find substantial decreases while Helland (2006) finds substantial *increases* in such positions. By exploiting the natural experiment due to the Satyam fiasco, which ensures that confounding firm-specific/director-specific factors

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coinciding with the timing of the adverse event are absent in our setting, we are able to identify the effect of an increase in the risks perceived by IDs on their labor market outcomes.

Third, our study documents the unadulterated, market-based response to a CG failure. Unlike the wave of CG failures in the U.S., which was followed by the enactment of the Sarbanes-Oxley Act, the Satyam fiasco was not followed by a regulatory response. As a result, the effects that we have studied resulted from a pure, market-based response by firms to the externalities engendered by the Satyam fiasco. Our results, therefore, lead us to conjecture that the changes in board composition, director remuneration, D&O insurance premiums, etc. documented by Linck et. al. (2008) as having resulted due to the passage of the Sarbanes-Oxley Act may have resulted nevertheless due to market-based responses following the wave of CG failures.

Fourth, our study highlights the differential effects of a CG failure in an emerging market vis-à-vis the developed markets due to various market failures that characterize emerging markets. The market failure generated from the lack of adequate monitoring support to IDs (through a robust market for corporate control or activist institutional investors) together with the legal failure stemming from unlimited personal liability possibly accounted for IDs voting with their feet. Therefore, our study suggests that legislative reforms that address these legal and market failures can enhance the potency of IDs, thereby enabling to bring expert IDs on boards.

Our paper resembles closely the study by Fahlenbrach et. al. (2010), who highlight a dark side associated with outside directors – they are likely to resign to protect their reputation or to avoid an increase in their workload when they anticipate that the firm on whose board they sit will perform poorly or disclose adverse news. We find evidence of a similar dark-side due to the adverse event caused by a CG failure that increased the risks and the associated liability perceived by IDs. We also find evidence of more vigilant monitoring by those IDs that decide to stay on boards. Apart from our study being set in an emerging market setting, the focus of this study is different from theirs: we examine the effect of an increase in liability perceived by IDs on boards.

2. Background

In this section, we provide the background information about the Satyam fiasco. We also provide background information about the mandatory levels of board independence in India.

2.1 The corporate governance scandal at Satyam

Satyam Computer Services Limited (hereafter Satyam) was founded in 1987 by B Ramalinga Raju, who became the firm's Chairman. Since 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, GE, etc. Satyam and its Chairman had acquired a stellar reputation for their entrepreneurial spirit and corporate governance practices.[6] The non-executive directors on its board included academics from India and abroad such as Prof. Krishna Palepu of Harvard Business School, the then Dean of the Indian School of Business, industry experts such as Vinod Dham (the inventor of Pentium chips 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 media spotlight on Dec 16th 2008 when its board unanimously approved the acquisition of two family owned companies using its $1.2 billion cash holding. This particular meeting was chaired by the then Dean of the Indian School of Business, who was an ID on the board. However, the acquisitions were called off a few hours' later when institutional investors – particularly the foreign institutional investors in the US – resisted by labeling it a self-dealing transaction.

Three weeks later, on the morning of Jan 7th 2009, Satyam's Chairman disclosed that the firm had been fudging its accounts for several years with the cooperation of the firm's auditor Price Waterhouse Coopers (PWC) and that its $1.2 billion cash holding was the result of a long-drawn

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[6] Months before the scandal, Satyam was awarded the Golden Peacock Global Award for Excellence in Corporate Governance by The World Council for Corporate Governance. Previously, Investor Relations Global Rankings (IRGR) had rated Satyam as the company with Best Corporate Governance Practices for 2006 and 2007. Satyam's Chairman had served as the Chairman of the National Association of Software and Service Companies (NASSCOM) and had been a member of the International Advisory Panel of Malaysia's Multimedia Super Corridor. Inter alia, he was awarded the Corporate Citizen of the Year award during the Asian Business Leadership Summit held in Hong Kong in 2002, was named as the IT Man of the Year by Dataquest in 2001 and was conferred the Entrepreneur of the Year Award by Ernst & Young, India in 2000.

accounting fraud and was largely non-existent.[7] 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% respectively.[8]

Ramalinga Raju has been in police custody ever since together with two auditors from PWC. Apart from a sustained barrage of vilification and aspersions on their competence and character in the national and international media, Satyam's directors have since then been subject to an intense grilling by the Criminal Bureau of India (CBI) and the federal government's Serious Fraud Investigation Office (SFIO). Class-action lawsuits have also been filed by U.S. investigators.[9]

Since IDs have to rely on the audited financial information to assess the health of the firm they are associated with and the auditor itself colluded with the firm's insiders in perpetrating the accounting fraud, IDs fears about the personal liabilities engendered by the hard to detect actions of unscrupulous insiders escalated after the Satyam fiasco. In other words, if a company with such a stellar reputation could be fudging its books in collusion with the firm's auditors, then no Indian firm could be trusted for not indulging in such manipulation.[10]

2.2   Legal ambiguities in delineating outside directors' liability

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. In fact, in his interviews of Indian IDs post the Satyam fiasco, Khanna and Mathew (2010) finds that the IDs on Indian corporate 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

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[7] It was later revealed by Raju that the transactions proposed on Dec 16th were an attempt to close the loop on the long-standing accounting fraud.

[8] The benchmark indexes fell by 4.43% and 4.19% respectively if we remove the effect of Satyam.

[9] Class-action suits by shareholders are not allowed in India.

[10] Prominent Indian shareholder activist Prithvi Haldea noted: "Till Satyam, independent directors used to take sitting fees and remained on the boards of 4-5 companies without proper knowledge of their functioning. But now many (independent directors) are worried that their life's reputation can be ruined overnight and they in fact not only become persona non-grata, but also invite media ridicule and government prosecution. Is the fee they earn enough for them to expose themselves to such risks, is a question many are asking?"

imposed and was not offset by adequate directors' and officers' insurance coverage."[11] Khanna and Mathew (2010) found 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." Deepak Parekh, a reputed banker and architect of several financial sector reforms 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." As well, the absence of the D&O insurance market in India implies that any (civil) liabilities faced by IDs have to be borne personally.

2.3 An exogenous shock to the risk of personal liability perceived by IDs

The Satyam fiasco provides us with a clean, economy-wide shock that increased the risk of personal liability perceived by IDs. The expected costs to an ID from potential personal liabilities equals the likelihood of an adverse event in the firm the IDs associated with multiplied by the personal liability incurred by the ID conditional on such an event. As we argued in section 2.1, IDs' perception of the likelihood of an adverse event increased post the Satyam fiasco. Furthermore, since personal liabilities incurred by IDs in India are non-zero (as discussed in section 2.2), the Satyam fiasco resulted in an increase in the perceived risk of personal liability.

Other important features relating to the scandal made it a clean, economy-wide shock. First, the scandal was completely unexpected before it happened. Since the scandal involved a firm that was quite feted for its CG practices and was in an industry that has been the internationally recognized "poster child" for its professionalism and competition, the Satyam failure came from a completely unexpected quarter. As a result, we do not expect any effect on the variables of interest before the scandal. Second, since the scandal unravelled within a short time span of three weeks, we are able to pinpoint the precise point in time when the effects would manifest. Third, any ID exits as well as changes in the boards of other firms are unlikely to be confounded by unobserved, firm-specific

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[11] Criminal liability on external directors can be brought about under clause 49 of the stock exchange listing agreement, The Indian Companies Act, 1956 and/or provisions of the Indian Penal Code that cover breach of trust, theft and cheating. Such criminal liability may trigger arrests and, potentially, convictions for directors.

factors *coinciding* with the precise time of the change since they were due to an unanticipated shock that was external to the firms in question. Finally, though the scandal was big enough to not only rock the Indian market on both days, regulators did not respond by enacting any new legislation or regulation. Therefore, the event provides us a natural experiment to examine the pure, unregulated effect of an economy-wide increase in the risk of personal liability perceived by IDs.

2.4 Mandatory board independence requirements in India

Readers also need to be aware of the mandatory requirements relating to board independence in India. In 2000, the Securities and Exchange Board of India (SEBI) – the Indian equivalent of the SEC – promulgated clause 49 of the stock exchange listing agreement. This was a key regulatory change that affected the characteristics of Board of Directors in Indian listed firms. Clause 49: (i) sets out the requirements of having IDs on corporate boards, (ii) defines independence (see the Appendix for details), 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 composed of at least one third as IDs. Furthermore, publicly traded firms where the Chairman of the board is an executive of the firm are required to have a board comprised of at least 50% IDs. While clause 49 sets out some specific duties for directors in general, it imposes the most specific requirements for IDs who also serve on the audit committee of the board.

3. Empirical Hypotheses

We examine empirically the effect of an increase in the risk of ID liability on board composition, director remuneration and board monitoring. These effects would manifest through the entry and exit decisions of IDs, where they evaluate the costs and benefits of remaining an ID post the Satyam fiasco. On the one hand, an increase in risk of liability increases the costs of being an ID and thereby may increase IDs' reluctance to either stay on corporate boards or join boards. On the other hand, for those IDs that decide to stay, increased liability may make them more vigilant and thereby enhance the quality of monitoring. We investigate both sides of this trade-off.

3.1 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 bankruptcy filing (Gilson (1990)) and directors of firms that restate earnings (Srinivasan (2005)) are likely to receive relatively fewer directorships. As well, 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). Yermack (2004) shows that outside directors receive financial rewards for good firm performance. Thus, the benefits to outside directors are closely linked to the performance of the firms on which they serve as outside directors.

However, 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. The indirect costs are directly proportional to the likelihood of an adverse event in the firm the IDs associated with.

3.2 Effects on board composition

A director compares the benefits associated with an ID position vis-à-vis the attendant costs when deciding whether or not to: (i) resign from an existing ID position; or (i) take up a new ID position. As discussed above in Section 2.2, the Satyam fiasco escalated the risk of personal liability (including the possible loss of reputation). As a result, 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 fiasco) would decide not to take up the position. Since some companies enjoyed a cushion above the mandatory level of board independence pre-crisis (as we show when we describe the summary statistics of our sample), we expect a reduction in the percentage of IDs on Indian corporate boards.

Furthermore, IDs are far from uniform in their expertise. Given that expert IDs face disproportionately greater costs from potential reputational damages, several expert individuals may simply refuse such positions or exit from their existing positions. Given the fact that companies are required to have a certain proportion of IDs on the board to fulfill clause 49 requirements, post the

fiasco, we expect that the average quality of IDs on the board would diminish. Furthermore, since firms in which more IDs exited have to fill more vacant slots, such firms may have to go further down the quality ladder when compared to firms where ID exits were lower. Therefore, we expect that the average quality of IDs on the board would decrease disproportionately more in those firms where ID exits were large when compared to those firms ID exits were small.

3.2.1 *Cross-sectional differences based on prior firm performance & accounting manipulation*

Post Jan '09, the perceived risk of personal ID liability increased across the economy. Since the likelihood of an adverse event that imposes personal liability on IDs is greater in firms that are performing poorly *a priori*, the costs associated with being an ID increased *disproportionately* more in poorly performing firms when compared to firms that are performing well. As well, such costs are likely to have increased disproportionately more in firms that were suspected to be indulging in accounting manipulation. Since the benefits associated with ID positions are proportional to firm performance, the expected benefits would be lower in a firm that is performing poorly. Therefore, we would expect the reduction in the percentage of IDs to be *disproportionately* more in firms that were performing poorly in December 2008, i.e. just a week before the Satyam fiasco and in firms that were suspected to be indulging in accounting manipulation.

3.3 Effect on director remuneration

Finally, since an increase in the risk of personal liability perceived by IDs increases the expected costs associated with ID positions, IDs would expect to be compensated more for assuming greater risks. Therefore, we expect an increase in director remuneration, particularly the fixed components of remuneration, to offset the greater risks.

3.4 Effect on monitoring by IDs

An increase in the liability perceived by IDs would make IDs more vigilant. Since the Satyam scandal highlighted risks faced by IDs from the hard-to-detect actions of insiders, we expect IDs to exert greater effort in minimizing the information deficit they face with respect to companies' insiders. Since regular board meetings and attendance in these meetings are necessary (though not necessarily sufficient) to minimizing this information deficit, we expect the number of board meetings

held as well as the attendance in these meetings to increase post the Satyam fiasco. Moreover, to decrease the possibility of adverse events in the firms that the IDs are associated with, IDs may require conflicts of interest in the board to be minimized. Since the presence of promoter directors and executive chairman would increase conflicts of interest, we expect these to decrease as well.

3.5 Substitution of monitoring by IDs through other channels

Given the exit of IDs, particularly the experts, and the resultant loss in the monitoring function, firms may respond in other ways to substitute for such effects. To assess the picture that resulted as a result of the Satyam fiasco in totality, we also examine other channels through which firms try to substitute monitoring by IDs. First, we examine the effect on board size, where the hypothesized effect is ambiguous. This is because, on the one hand, exit of IDs would lower board size. On the other hand, the enhanced demand for monitoring would lead to larger boards. If board size were to increase despite the increased ID exits, this would be indicative of this substitution effect.

These hypotheses are summarized in Table 1.

**** Insert Table 1 about here ****

4.   Data construction and its description

We discuss our data sources and regression variables in this section.

4.1   Board and director characteristics

Using the mandatory filings made to the Bombay Stock Exchange (BSE) by listed companies, we hand collected a *unique* dataset of board and director characteristics. To generate this dataset, we focus on those BSE listed firms that were required to comply with clause 49 of the stock exchange listing requirements. Our sample spans five years from 2006 to 2010.

As mentioned in section 2.5, all publicly traded Indian firms with paid up capital above Rupees 3 crores (~US $600,000) are required to comply with clause 49 requirements. There are over 2600 such firms listed at the BSE.[12] These firms are the object of our study since, as part of their listing requirements at the BSE, they are mandated to file information about: (i) all director appointments and director exits along with the date of appointments and exits on the board; (ii) the classification of

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[12] This set excludes the suspended/Z Group companies, which do not have to Comply with clause 49.

each director on the board into "ID", "non-executive, non-ID", "executive director", "promoter director" and "nominee director"; (iii) the designation of each director on the board; and (iv) director characteristics such as educational qualifications, professional experience etc. We hand collected this data using information from the Directors Database (www.directorsdatabase.com).

For each individual director, we extracted the educational background and occupation. Using a keyword search, we classified directors as experts if the director's "educational background" returned a business/ law degree or if the "occupation" returned lawyer, academic or government official.[14]

4.2 Director compensation, board size, meetings attended, etc.

We combine the above data on director and board characteristics with data from the Prowess database maintained by the Centre for Monitoring Indian Economy, Mumbai, India (CMIE), which contains information on firm characteristics for all publicly traded companies and many unlisted companies in India. The Prowess database provides us information on director compensation, board size, number of board meetings held, number of board meetings attended by each director as well as annual financial information for each of the companies.

Our variables of interest, their definition and their sources are listed in Table 2.

**** Insert Table 2 about here ****

4.3 Descriptive statistics

The descriptive statistics for the variables used in the analysis are provided in Table 3.

**** Insert Table 3 about here ****

First, we notice that for the median firm in our sample, about 40% of the directors on the board are independent while for the average firm about half the directors on the board are independent. Since clause 49 requirements mandate that at least a third of the board has to be comprised of IDs, this suggests that several firms in our sample have more IDs than legally mandated. Second, we notice that while a majority of the IDs fall in the expert category (i.e. either possess business or law degrees

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[14] 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", "Advocate" etc. For Academics, we searched "Lecturer", "Reader", "Professor", "Faculty", "Dean", "Vice Chancellor", etc. For Government officials, we searched "Secretary", "Government of India", etc.

or are lawyers, academics or civil servants by profession), a small minority of EDs fall in this expert category. Third, the board of the median (average) firm comprises of seven (eight) members. Fourth, the board of the median (average) firm met on average six (seven) times per year during our sample period. The boards in some firms only met once a year as seen in the minimum number of meetings held. Fifth, we find considerable variation in the average percentage of board meetings attended by the board members: while in some firms in a particular year the average board member attended less than 10% of the board meetings, in some firms the directors attended all the board meetings in a particular year. In the average as well as the median firm, a director attends every two out of three meetings held in a year. Sixth, we find that in about 28% of the firm-years in our sample, the CEO of the firm was also the Chairman of the board; in the median firm, however, the CEO and Chairman roles are separated. Seventh, on average every one in five directors happens to be a promoter director. Finally, on average promoters hold about half of the equity in Indian firms.

Figure 1 shows the number of exits by IDs per month over the time period July 2007 to July 2010. The *en masse* exit of IDs immediately after the Satyam fiasco, as evidenced by the sharp increase in ID exits in Jan 2009, in unmistakable. We also notice in Figure 1 that compared to the number of exits per month till Dec 2008, the number of exits per month is on average greater in the period following Jan 2009. Note that these exits do not include either the exits by directors from Satyam or the exits by erstwhile Satyam directors from other firms. Thus, both the sharp increase in ID exits in January 2009 as well as the overall increase in the post-Satyam period occurred due to the *exogenous* shock to the risks of personal liability perceived by IDs.

Figures 2-4 provide a visual representation of the annual averages (across all firms in our sample) of the key variables two years before and after the Satyam crisis. In Figure 2, we notice that the percentage of IDs peaked in 2009 to fall substantially thereafter. We also notice that the percentage of expert IDs peaked in 2008 to fall subsequently both in 2009 and 2010. Importantly, we notice the absence of a time trend in both the percentage of IDs as well as the percentage of expert IDs. In contrast, in Figure 3, we find a secularly increasing trend in directors' compensation over the time period 2007-2010 though the percentage of variable pay decreased considerably in 2009 and partially recovered in 2010. Finally in Figure 4, we notice that Executive Director appointments increased in

2009 when compared to 2008 and then increased substantially more in 2010 when compared to that in 2009. We also notice that the percentage of EDs on the board increased substantially in 2010 after being primarily range bound in the years 2007 to 2009.

5. Results

We start off by taking a simple before-after look at ID exits, board characteristics and board monitoring. Since the Satyam crisis occurred on January 8, we define the period from 2006 to 2008 as the "before" (pre-Satyam) period and the years 2009 and 2010 for which we have data as the "after" (post-Satyam). Table 4 shows the average values of the dependent variables for the pre- and post-Satyam periods, the percentage change in the variables and their statistical significance.

**** Insert Table 4 about here ****

First, we notice that the average number of IDs leaving boards every year has risen by over 20% from 0.3 to 0.36 after the Satyam fiasco: this difference is statistically significant at a 1% level. Second, the percentage of expert IDs as captured by their education and professional background has declined significantly. In contrast, the percentage of expert EDs has increased substantially. Directors are earning more after the crisis though this could just be a manifestation of the time trend we observed in Figure 3. Average board size has increased significantly post-Satyam – a result somewhat surprising given the increased departure of IDs. Since larger boards may be more effective monitors, the enhanced need for monitoring post the Satyam episode may have led to this increase in board size. Attendance in board meetings appears to have increased by about 3%. The proportion of Executive Chairmen has fallen with borderline statistical significance while the number of promoter directors has shown a close to 10% decline. Broadly, the univariate analysis suggests that Indian boards differed significantly along several dimensions before and after the Satyam fiasco.

5.1 Exits by IDs

To start with, we examine Hypothesis 1a, which predicts that IDs would exit from *other* firms post the Satyam fiasco. Both in Figure 1 and in the univariate comparisons in Table 4, we found that ID exits increased substantially post the Satyam fiasco. To show that this change was indeed due to

the Satyam fiasco and not due to other confounding factors, we proceed to examine the effect in a multivariate framework using the following regression:

$$ID\ exits(i,t) = \beta_0 + \beta_1 * PostSatyam(t) + \beta * X(i,t) + \varepsilon(i,t) \qquad (1)$$

where *PostSatyam(t)* equals 1 for 2009-10 and 0 for 2006-08; X(i,t) denotes the set of control variables for firm i at time t. Our sample period spans the years 2006-2010 and includes the set of BSE-listed firms that complied with clause 49. In all our regressions, we estimate standard errors that are robust to heteroskedasticity and are clustered by firm to account for the possibility of autocorrelation in error terms within a firm.

**** Insert Table 5 about here ****

Column 1 of Table 5 shows the results obtained by estimating (1), where we employ the following set of control variables. Since ID resignations may have been motivated by the riskiness of a firm, we use volatility of a firm's stock return to capture firm risk and logarithm of sales as a proxy for firm size to capture additional risk associated with smaller firms. To account for the fact that IDs may have resigned more from firms that were performing poorly, we include the firm's ROA. To control for the fact that IDs may have resigned more from firms whose operations were more complex, we follow Linck *et al.* (2009) and include the ratio of R&D expenditure to assets to proxy for the firm's operational complexity. Firms facing greater financial constraints may be more likely to perform poorly, which may motivate an ID to resign from such a firm. Therefore, following Linck *et al.* (2009), we include a dummy for zero dividend paying companies as a proxy for the firm's financial constraints. Finally, since the Satyam case involved a family-owned firm, IDs may be more likely to exits from firms that are controlled by families, hereafter labelled "promoter controlled firms." Therefore, we include the promoter's shareholding to proxy for the same. Except for the promoters' shareholding, the set of control variables is similar to that employed by Linck *et al.* (2009).

In column 2, we include firm fixed effects as well, which enables us to control for unobserved firm-specific factors that may have motivated ID exits:

$$ID\ exits(i,t) = \beta_i + \beta_1 * PostSatyam(t) + \beta * X(i,t) + \varepsilon(i,t) \qquad (2)$$

In both column 1 and 2, we find that post the Satyam fiasco, ID exits increased; this effect is statistically significant. Among the control variables, we find that the zero dividend dummy, which

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proxies the extent of financial constraints in a firm, is associated positively and significantly with ID exits; this suggests that IDs exited more from firms that faced financial constraints.

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:

$$ID\ exits(i,t)/Board\ size(i,t) = \beta_i + \beta_1*PostSatyam(t) + \beta*X(i,t) + \varepsilon(i,t) \qquad (3)$$

We find our results in columns 1 and 2 to be unaltered.

5.1.1   Economic magnitude

The economic effect of the Satyam fiasco on ID exits is significant as well. Compared to the average number of ID exits, which equals 0.323 from Table 3, the increase of 0.041 in column 2 amounts to a 12.7% increase.

5.2   Board independence after the Satyam fiasco

While the evidence about increased ID exits provides preliminary evidence confirming the increase in risk of personal liability perceived by IDs, it does not provide a complete picture since the supply-side shock could also manifest in potential IDs deciding not to take up ID positions. To examine the total effect of this shock, we now examine Hypothesis 1b relating to the effect on the percentage of IDs on Indian corporate boards. Table 6 shows the results of these tests. In column 1, we run the following regression:

$$\%IDs(i,t) = \beta_0 + \beta_1*PostSatyam(t) + \beta*X(i,t) + \varepsilon(i,t) \qquad (4)$$

where we include PostSatyam(t) as well as several control variables that correlate with board independence. Linck *et al.* (2009) argue that large firms or firms with complex operating and financial structures benefit more from outside advising and monitoring. Consistent with their hypothesis, they find that firms with high R&D intensity have more independent boards. We therefore employ the ratio of R&D expenditure to assets to proxy for the firm's complexity. They also argue that outsiders lack firm-specific information and, hence, face information acquisition and processing costs. More IDs on the board also face additional costs of free-rider, coordination, and/or communication problems (Lipton and Lorsch 1992; Jensen 1993). Therefore, Linck et al. (2009) predict that board's independence decreases in monitoring costs. They use standard proxies for information asymmetry

(stock return volatility) and growth opportunities (R&D intensity) to measure firms' monitoring costs. Following Linck et al. (2009), we include the log of sales to capture firm size, stock return volatility to proxy information asymmetry and R&D expenditure/assets to proxy for the firm's growth opportunities. Boone *et al.* (2007) and Linck et al. (2009) find that firm performance proxies for a CEO's power and that CEO powered correlates negatively with board independence. We therefore include the firm's Return on Assets (ROA) to proxy firm performance. Since these studies also find that firms that are less cash constrained have more independent boards, we follow them in including a zero dividend dummy which is correlated with the firm's cash constraints.

Morck and Yeung (2003) argue that when a family controls a group of firms, such structures give rise to a set of agency problems that are different from those in which shareholder ownership is dispersed. These agency costs arise because the managers act on behalf of the controlling family, but not necessarily on behalf of the shareholders.[15] Therefore, we include the proportion of equity held by the promoter to proxy agency costs in Indian family-owned firms.

**** Insert Table 6 about here ****

We find in column 1 that the coefficient of PostSatyam(t) is negative and statistically significant. Among the control variables that we included, we find that larger firms have more independent boards as seen in the positive coefficient of the log of sales. Consistent with the argument made in Boone *et al.* (2007) and Linck et al. (2009) that firm performance proxies for a CEO's power and that CEO power correlates negatively with board independence, we find a negative and statistically significant correlation between ROA and the percentage of IDs on the board. Also, consistent with the fact that agency costs may be greater in firms where promoters' holding is greater and the fact that greater board independence may be an endogenous response to greater agency costs, we find a negative correlation between promoters holding and the percentage of IDs on the board. However, the coefficients on our proxies for monitoring costs (volatility) and firm complexity in the firm's growth opportunities (R&D expenditures/assets) and the zero dividend dummy are statistically

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[15] For example, to avoid "creative self-destruction," a family might quash innovation in one firm to protect its obsolete investment in another.

indistinguishable from zero. In column 2, we also include firm fixed effects to capture the effect of firm characteristics that do not change substantially over time:

$$\%IDs(i,t) \; = \; \beta_i + \beta_1*PostSatyam(t) + \beta*X(i,t) + \varepsilon(i,t) \qquad\qquad (5)$$

Since our sample spans a five-year time period and many of our control variables are unlikely to change dramatically over our time series, this specification may reduce the explanatory power of our firm characteristics. Along these expected lines, we find that in column 2 even the control variables that were significant in column 1 (log of sales, ROA and promoters holding) lose their explanatory power and become statistically indistinguishable from zero. However, the inclusion of the firm fixed effects should not impact our estimate of post Satyam fiasco effect, which is largely a time-series estimate. This is precisely what we find with the coefficient of PostSatyam(t) being negative and statistically significant in column 2.

5.2.1 *Separating the effect of Satyam fiasco from that of the onset of financial crisis*

Are the above results due to the Satyam fiasco or due to the increase in risk perceptions from the onset of the financial crisis, which can be dated back to September 2008, when the Lehman Brothers failure happened? With respect to this alternative interpretation, we note that in Figure 1 the jump in ID exits occurred in January 2009. In fact, in the three months between the onset of the financial crisis and the Satyam fiasco (October to December 2008), ID exits were no different from those in the preceding months. Thus, by looking at Figure 1 it is unmistakable that the *en masse* exit by IDs happened due to the Satyam fiasco 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 examine: (i) the difference in the percentage of IDs in 2009 and 2010 vis-à-vis that in 2008 to capture the effect of the Satyam fiasco separated from that of the onset of the financial crisis in column 3 of Table 6; and (ii) 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 in column 4 of Table 6. We notice in column 4 that the coefficient of the financial crisis start dummy, which equals one for the year 2008 and zero for the year 2007, is statistically indistinguishable from zero. In contrast, in column 3, the coefficient of the PostSatyam(t) is negative and statistically significant. This

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reassures us that the decrease in the percentage of IDs in Indian boards was more plausibly due to the increase in risk perceptions of IDs post Satyam fiasco and not due to the onset of the financial crisis.

5.2.2 Economic magnitudes

As argued above, the coefficient of PostSatyam(t) in column 3 measures the pure effect of the Satyam fiasco on the percentage of IDs in Indian corporate boards. Using this coefficient, we find that due to the Satyam fiasco, the percentage of IDs on Indian corporate boards reduced by 0.68%. In Table 3, we noted that the median firm had 40% of its directors as independent. This decrease of 0.68% is despite the clause 49 mandated needs for firms to maintain a certain threshold level of IDs and possible new appointments. Therefore, the decrease is economically significant.

5.2.3 Difference-in-difference tests

We now investigate Hypothesis H2 using the following regression specification:

$$\%IDs(i,t) = \beta_i + \beta_t + [\beta_1 * PostSatyam(t) + \beta_2] * High\ performance(i,t-1) + \beta * X(i,t) + \varepsilon(i,t) \qquad (6)$$

Apart from the firm fixed effects β_i, which control for unobserved factors that affect board independence at the firm level, the year fixed effects β_t enable us to control for the effect of time trends in board independence. *High performance(i,t-1)* is a dummy that equals one if the firm ranked above the median with respect to the performance measure that we employ. To ensure that the ranking of firms by performance is done *a priori* before we observe board independence, we use the lagged value of the firm performance measure. Given the firm and year fixed effects, β_1 estimates the effect of the Satyam fiasco on board independence as a difference-in-difference, i.e. the before-after difference due to the Satyam fiasco in the firms that were performing well vis-à-vis the same difference in firms that were performing poorly.

**** Insert Table 7 about here ****

Table 7 reports the results of these tests. In columns 1 to 3, we use ROA, sales growth and profit margin as the performance measures respectively and find that the coefficient of interaction is positive and statistically significant for each of these three measures of firm performance. Thus, board independence decreased relatively less in the high-performance firms; conversely, board

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independence decreased disproportionately more in the low performance firms. This finding is consistent with Hypothesis H2.

5.2.4 *Did the possibility of accounting manipulation affect board independence post-Satyam?*

To examine whether the possibility of accounting manipulation affected ID exits and new IDs appointments, we replace *High performance(i,t-1)* in (2) with *Accruals(i,t-1)* and find that the interaction effect is negative and statistically significant, which suggests that ID entry and exits were affected by the fear of accounting manipulation.

5.3 Changes in quality of IDs

In Table 8, to investigate Hypothesis H3a, we examine the effect of the Satyam fiasco on the percentage of expert IDs, whom we identify as lawyers, business professionals, financial experts, retired executives, consultants, academicians, civil servants or government officials.

**** Insert Table 8 about here ****

In columns 1 to 4, the specifications that we employ and the set of control variables that we include are identical to those in Table 6. The coefficient of PostSatyam(t) is once again negative. Furthermore by comparing columns 3 and 4, we notice that the decrease in the percentage of expert IDs is not because of the onset of the financial crisis but is more plausibly due to the Satyam fiasco. In Figure 2, we had noted that the percentage of expert IDs fell both in 2009 and 2010. Consistent with this pattern, we find that the coefficient of PostSatyam(t) in column 3 is about a third of the coefficient observed in column 1, which indicates that the effect of the Satyam fiasco on the percentage of expert IDs was not only felt immediately in the year 2009 but continued to be felt in the year 2010. Also, we find that the percentage of expert IDs is positively correlated with a firm's size, financial constraints and promoters' shareholding.

5.3.1 *Relative differences in percentage of expert IDs depending upon number of exits*

In column 5, we interact PostSatyam(t) with the number of ID exits to examine if % of expert IDs decreased disproportionately more in firms where IDs existed relatively more (Hypothesis 3b):

%ExpertIDs(i,t) = β_i + β_t + β_1*PostSatyam(t)*IDExits(i,t) + β_2* IDExits(i,t) + β*X(i,t) + ε(i,t) (7)

The above specification enables us to control for time trends as well as firm-specific unobserved factors affecting ID quality through the year fixed effects and the firm fixed effects respectively. We find that, consistent with Hypothesis 3b, ID quality decreased disproportionately more in those firms that experienced greater ID exits when compared to firms that experienced lower number of ID exits.

5.4   Changes in Director Remuneration

In Table 9, investigate Hypothesis 4a, we examine the effects on ID remuneration.

**** Insert Table 9 about here ****

To mitigate the effect of the outliers in director remuneration, we use the logarithm of the remuneration per director as the dependent variable. In columns 1 to 4, the specifications that we employ and the set of control variables that we include are identical to that in Table 6. The coefficient of PostSatyam(t) is positive and is statistically significant across columns 1 to 3. Furthermore, by comparing columns 3 and 4, we notice that the increase in director remuneration was not because of the onset of the financial crisis but was more plausibly due to the Satyam fiasco. In column 5, to investigate Hypothesis 4b, we examine the effect of the Satyam fiasco on variable part of compensation and find that variable compensation decreased, which is consistent with the increase in the risks faced by IDs post the Satyam fiasco.

Among the control variables, firm size, firm profitability, firm complexity and growth opportunities (R&D expenditure/assets), the absence of cash constraints are significantly and positively related to total director remuneration. These results are consistent with the effects documented in the prior literature, especially the ones based on the contracting theories (Hermalin and Weisbach, 1988, 1998), which predict a positive relationship between pay and firm performance, job complexity, and the absence of cash constraints.

5.4.1   *Separating the effect of increased risk vis-à-vis that of increased workload*

The increase in total compensation that we find in columns 1 to 3 could be due to the sum of two effects. First, as we hypothesize, the increase in risks perceived by IDs led to the increase in compensation. Second it is possible that post Satyam the workload borne by directors has increased, which led to the increase in compensation. To investigate whether the increase in total compensation

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was indeed due to the increased perception of risk, we use the log of total compensation per director normalized by the average number of meetings attended by directors on the board in a given year. Since increased workload would manifest in the directors attending more board meetings on average, this measure accounts for the increase in compensation due to an increase in workload. Using this dependent variable in column 6, we find that the coefficient of the PostSatyam(t) is positive and statistically significant. Thus, we conclude that even after controlling for a possible increase in director workload, the per director compensation increased, which suggests that the increase in risks post the Satyam fiasco indeed lead to an increase in director compensation.

5.4.2 Changes in ID remuneration

In Panel B of Table 9, we examine the effect on compensation of IDs. Since information about ID remuneration is only available to us for a sub-sample of firms, the sample size in these tests is smaller. Using specifications that are very similar to those employed in Panel A, we find that indeed ID remuneration increased because of the increase in risks post the Satyam fiasco.

5.4.3 Economic magnitude

The economic effect of the Satyam fiasco on total ID remuneration can be estimated using the coefficient of the PostSatyam(t) in column 3 of Panel B of Table9. Since the dependent variable is log of total remuneration per director, post Satyam total remuneration increased by $\exp(0.274) - 1 = 31.5\%$. This increase is lower in magnitude to the effect that Link *et al.* (2008) find for the increase in non-executive director compensation post the Sarbanes-Oxley, which equalled 103%, 80% and 56% for the small, medium and large firms.

Overall, our results are consistent with the hypothesis that the dramatic increase in IDs' risks post the Satyam fiasco significantly increased ID pay.

5.5 Accounting for the possible effects of a decrease in the faith in monitoring by IDs

The Satyam fiasco raised questions about the efficacy of IDs as a monitoring institution and may have reduced demand for ID services. Theoretical work highlights two major functions of IDs: monitoring and advising (see Hermalin and Weisbach (1998), Adams and Ferreira (2007), Raheja (2005), and Harris and Raviv (2006)). However, IDs have to rely on the information provided by

insiders to be effective (Harris and Raviv, 2006). Since such information may not be easily forthcoming from corporate insiders who owe their allegiance to the promoters/ controlling shareholders, the *de facto* role of IDs remains questionable even in developed markets. As well, considerable skepticism prevails about the "independence" of IDs even in the U.S. (see Byoung-Hyown and Kim, 2009). Given the skepticism about the *de facto* independence and efficacy of IDs in developed markets, it is natural that the role of IDs has been viewed with considerable doubt in emerging market settings, where relationships frequently matter more than explicit contracts (see Khanna and Palepu, 2010 for instance).

The Satyam fiasco considerably heightened scepticism about (i) the purported "independence" of IDs; and (ii) the efficacy of IDs in monitoring the self-serving insiders. As described above, though Satyam had an enviable board comprised of leading luminaries, on Dec 16 the board had given a go-ahead to an acquisition of two real estate companies by Satyam – companies where Satyam Promoter Raju's family had significant stakes. To the rest of the world, particularly institutional investors in the U.S. where Satyam's ADRs were listed, this appeared to be a gross dereliction of supervisory duty by a stellar board in a clear case of a related party transaction. Though the Satyam stock took a severe drubbing and the move was abandoned within hours, the incident cast doubt not only on the purported "independence" of the Satyam board but also on the efficacy of IDs themselves.

The effect of a decrease in demand for IDs on the percentage of IDs on Indian corporate boards would reinforce the effects of an increase in the risk of personal liability perceived by IDs. However, their effects on the ID compensation oppose each other. As a result, any effect of reduced demand would only stack the odds against us finding evidence of increased risk perceived by IDs leading to an increase in ID compensation. Therefore, the tests pertaining to ID remuneration provide compelling evidence that an increase in the perceived risk of personal liability adversely affected the percentage and quality of IDs on boards and increased director compensation.

5.6   Effect on monitoring by IDs that continue to hold ID positions

We investigate Hypothesis H5 in Table 10. In columns 1 and 2, we investigate Hypothesis H5a and find that the number of board meetings held increased significantly after the Satyam fiasco.

Economically, post the Satyam fiasco, we find that the average board meets one more time per year compared to the average before the fiasco. In columns 3 and 4, we investigate Hypothesis H5b and find that the average attendance in board meetings has increased on average by about 0.5-0.8%. In columns 5 and 6, we specifically examine the effect on the percentage of board meetings attended by outside directors and find that the increase in the percentage of meetings attended by outside directors is greater than the increase for the average director. This suggests that post the Satyam fiasco, outside directors are attending meetings significantly more regularly compared to the period before the Satyam fiasco. In columns 7 and 8, we investigate Hypotheses H5c and H5d respectively and find evidence that conflict of interests on the board, as measured by the percentage of executive chairman and the percentage of promoter directors, has declined significantly post the Satyam fiasco. Overall, we conclude that the evidence is consistent with greater monitoring by existing IDs.

**** Insert Table 10 about here ****

5.7   Substitution of monitoring by IDs through other channels

We investigate Hypothesis H6 in Table 11 and find in column 1 that board size has increased significantly post the Satyam fiasco; given the median board size of seven members from Table 3, the increase in board size by 0.214 represents a 3% increase. Given the fact that this increase occurred despite the exits by IDs and the fact that larger boards are supposed to be better monitors, this evidence suggests that firms try to substitute lower monitoring by IDs by expanding board size. Given the ID exits, the increase in board size could have happened either through an increase in outside directors that are not independent or through an increase in EDs. To understand more clearly the mechanism for this increase in board size, we examine the change in the percentage of ED's on the board in column 2. We find that the percentage of EDs on corporate boards increased significantly post the Satyam fiasco. Since such an increase must have happened to greater appointment of EDs, we investigate the same in column 3 and find that ED appointments increased significantly post the Satyam fiasco. Thus, board size seems to have increased due to greater appointment of EDs.

**** Insert Table 11 about here ****

This increase in percentage of EDs is particularly noteworthy since firms could have let go off their EDs to counterbalance the IDs that exited and thereby maintain the mandatory level of board independence. Since the increase in the percentage of EDs could also be due to a drive by the senior management/controlling shareholder to entrench themselves, we investigate this possibility in column (4) and find that the percentage of expert EDs (as measured by education and profession) actually increased post the Satyam fiasco. Since CEOs with a desire for entrenchment are more likely to appoint "dummy insiders," the increase in the percentage of expert EDs is not consistent with the entrenchment motivation. Furthermore, the decrease in the percentage of CEO-chairmen and the percentage of promoter directors (as seen in Table 10) is also not consistent with the entrenchment motivation. These findings suggest that companies may now be relying more on having multiple voices of the top management in the board perhaps to balance out to some extent the power of the CEO. Theoretically, these findings are consistent with the argument in Acharya *et al.* (2011) that internal governance can mitigate agency problems when the potential reaction of subordinates can limit the self-serving actions of top management. Thus, these findings are consistent with firms using motivated subordinates to substitute for lower monitoring by IDs post the Satyam fiasco.

5.8 Effect of ID exits on ex-post performance

In Table 12, we investigate the effect of ID exits on ex-post firm performance using the following regression specification:

$$FirmPerformance\ (i,t) = \beta_i + \beta_t + [\beta_1 * PostSatyam(t-1) + \beta_2] * IDExits(i,t-1) + \varepsilon(i,t) \qquad (8)$$

where IDExits(i,t-1) equals zero for firm i in year t-1 if it did not experience any ID exits in that year. We use ROA, profit margin and Tobin's Q as the proxies for firm performance. Given the firm and year fixed effects, the coefficient β_1 estimates the difference-in-difference effect of ID exits in a particular year on firm performance in the next year. In this difference-in-difference estimate, the group of firms where there was no ID exits (at least one ID exit) constitutes the control (treatment) group. In fact, the above specification also exploits variation in the number of ID exits among those firms that experienced such exits.

**** Insert Table 12 about here ****

We find that using either of these three measures of firm performance, firms from which IDs exited performed no worse when compared to firms from which IDs did not exit. This result is consistent with the reduction in monitoring by IDs due to ID exits being offset by the combined effect of (i) better monitoring by existing IDs; and (ii) firms choosing to substitute monitoring by IDs through monitoring by other channels.

6. Conclusion

Deciding the optimal level of liability to impose on IDs presents the following trade-off. On the one hand, an increase in ID liability may motivate IDs to be more vigilant and, thereby, decrease instances where IDs are found "sleeping at the wheel." On the other hand, increasing the liability imposed on IDs may increase the costs associated with ID positions and, thereby, shrink the supply of IDs. In this study, we examine the effect of a perceived increase in the personal liability faced by IDs on the market for IDs. Since Directors and Officers insurance changes with the risk of personal liabilities, studying this question is difficult in developed markets. We use a natural experiment in India – a widespread exodus of IDs from several firms in the wake of a major fraud – to show that an increase in the perceived risk of personal liability faced by IDs adversely affects the number and quality of IDs on corporate boards and increases the cost of ID services, on the one hand, and improves ID monitoring on the other hand.

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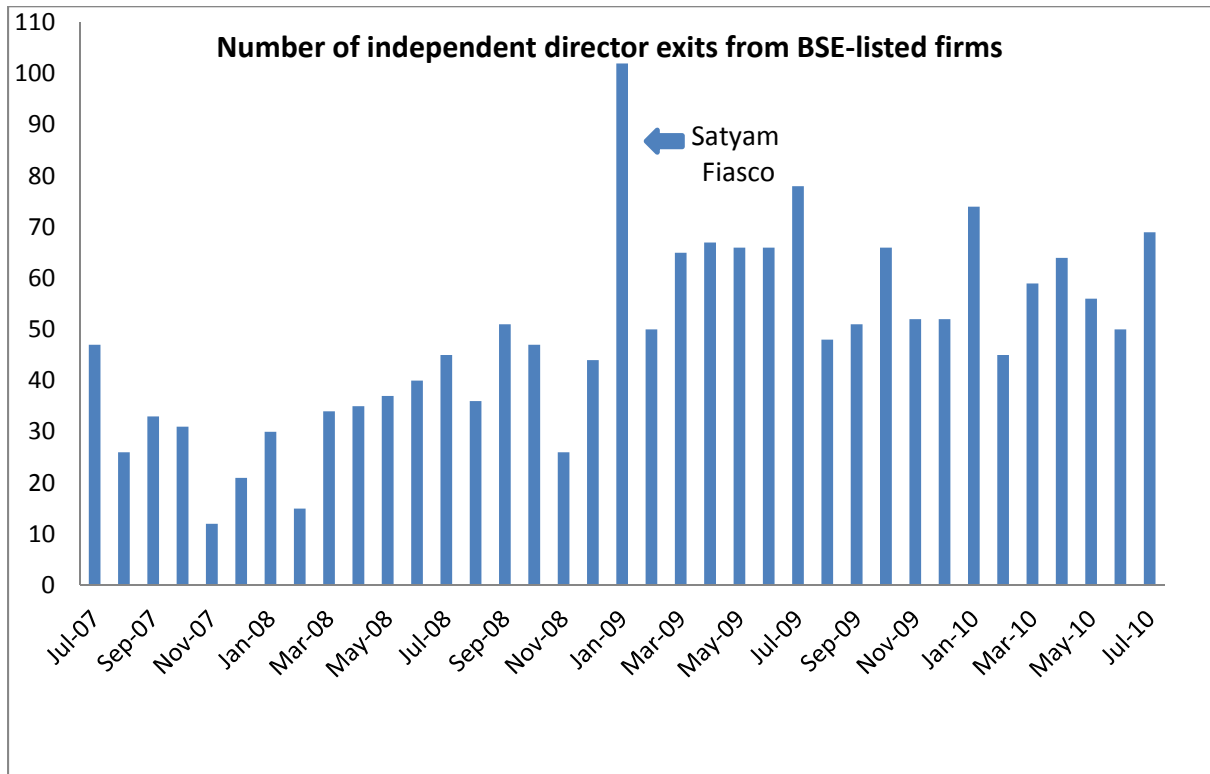
Figure 1: Exodus of IDs from Indian listed firms Jul '07 to Jul '10
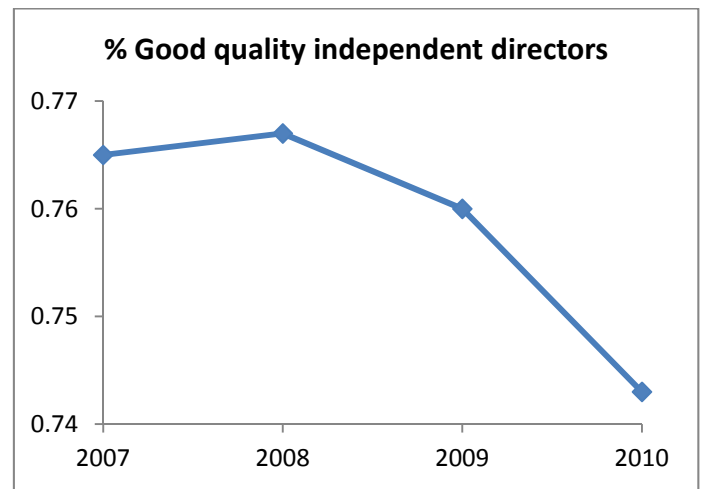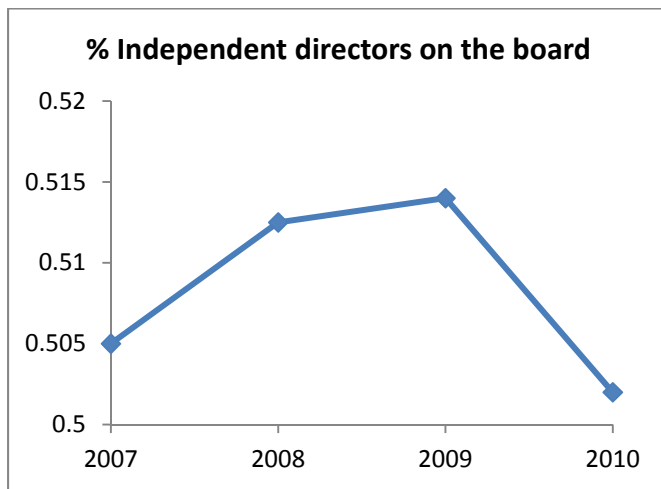

Figure 2: Percentage of IDs and the percentage of good quality IDs on Indian corporate boards from 2007 to 2010
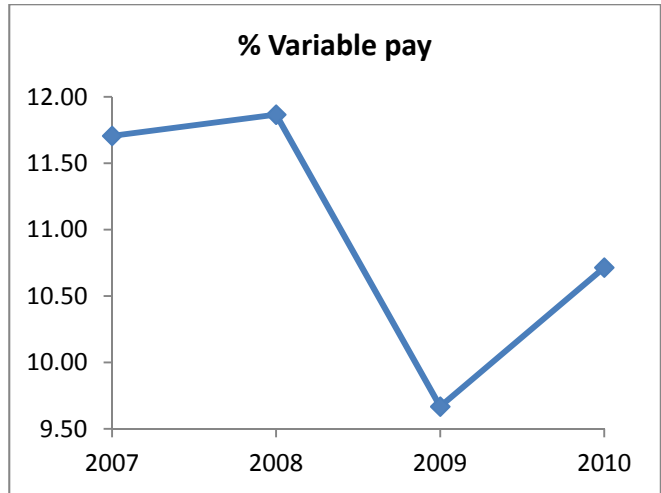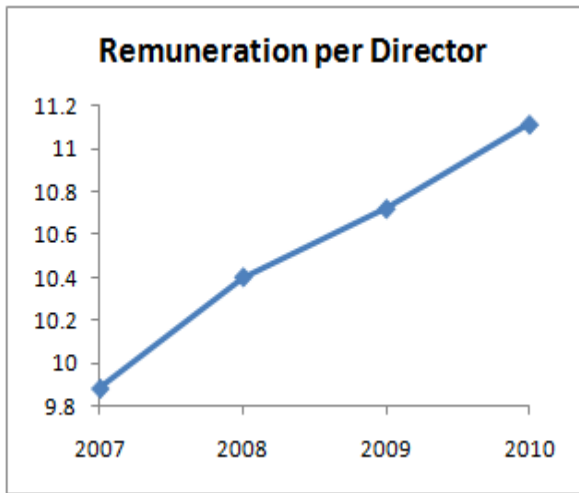
Figure 3: ID remuneration from 2007 to 2010
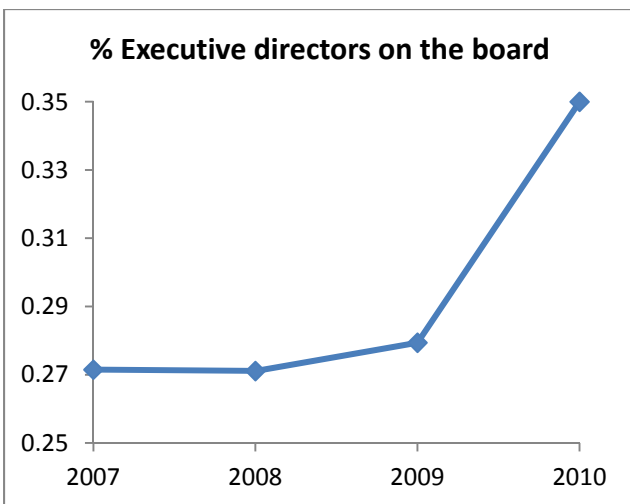
Figure 4: Appointment of EDs to Indian corporate boards and the percentage of EDs on Indian corporate boards from 2007 to 2010

Table 1: Summary of main predictions

S. No.	Attribute	Predicted effect	Reasoning
H1	a. ID exits b % IDs	↑ ↓	An increase in liability perceived by IDs increases the costs associated with ID positions leading to ID exits. ID exits together with increased reluctance of new IDs to join boards lowers the percentage of IDs on the board.
H2	a. Decrease in % of IDs in poorly performing firms minus the decrease in well performing firms b. Decrease in % of IDs in firms more likely to manipulate earnings minus the decrease in firms less likely to manipulate earnings	Greater	The benefits associated with ID positions are proportional to firm performance. Moreover, the possibility of an adverse event increases with decreasing firm performance and with the likelihood of accounting manipulation. Therefore, an increase in ID liability makes it more likely that IDs will exit from poorly performing firms and firms suspected of accounting manipulation. Also, new IDs will find the cost-benefit trade-off to be adverse in poorly performing firms and firms suspected of accounting manipulation.
H3	a. ID quality b. Decrease in ID quality in firms with more ID exits minus the decrease in firms with less exits	↓ Greater	A decrease in supply implies that for expert directors the "reserve price" at which they would be willing to offer their ID services is lower than the new equilibrium price. Therefore, expert directors exit the market. Since firms where more IDs exited have to fill more vacant slots, such firms may have to go down the quality ladder further when compared to firms where ID exits were lower.
H4	a. Total remuneration per ID b. Variable pay	↑ ↓	An increase in ID liability increases the risks associated holding an ID position. Therefore, IDs expect greater remuneration, especially fixed remuneration, to compensate for such risks.
H5	a. Number of board meetings held per year b. % of board meetings attended c. Percentage of promoter directors d. Instances of CEO being chairman of the board	↑ ↑ ↓ ↓	An increase in ID liability makes IDs more vigilant, which should increase the quantity of monitoring as reflected in the number of board meetings held earlier as well as the attendance in board meetings. Existing IDs would like to minimize conflicts of interest on the board to reduce instances of adverse outcomes on the firm said associated with.
H6	Board size	?	The exit of IDs predicts a decrease in board size while firms' efforts to substitute monitoring by IDs by adding more members to the board predicts an increase in board size.

Table 2: Variables and Descriptions

The following tables give a brief description of the variables and their sources.

Variable	Description	Source
ID exits	Number of ID exits from the board	Directors Database
Board Size	Number of directors on the board	Prowess
% IDs	Proportion of IDs on the board	Directors Database
% Expert IDs	Percentage of IDs who are lawyers, professionals, financial experts, consultants etc.	Directors Database
Total Remuneration per director	Mean of all components of remuneration of all directors on the board	Prowess
% Variable pay	Ratio of Bonus pay to the Total remuneration	Prowess
% Meetings attendance	Average meetings attended by the board scaled by the total meetings held	Prowess
Post Satyam fiasco dummy	Variable that takes a value of 1 if year is 2009 or 2010, 0 otherwise	Prowess
Volatility	The volatility of the firm's daily stock returns	Prowess
log(Sales)	Natural logarithm of annual sales revenue in crore rupees	Prowess
ROA	Earnings before interest and taxes scaled by total assets	Prowess
Debt to Equity ratio	The ratio of Total debt to Total equity	Prowess
R & D Expenditure/Assets	R&D expenditure over total assets	Prowess
Zero dividend dummy	Variable that takes a value of 1 if a firm does not pay any dividend, 0 otherwise	Prowess

Table 3: 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.

Variable	Obns.	Min.	Max.	Mean	Median	Std. Dev.
% IDs	13189	0.33	0.75	50.7	40.5	17.2
ID exits	13265	0	9	0.323	0	0.723
% Expert IDs	12725	0	100	76.1	80	26.6
% Expert EDs	13265	0	100	13.4	0	17.9
Total Remuneration per director (in INR million)	12394	0.11	92.7	1.09	0.27	3.13
% EDs	13189	0.10	0.60	29.3	23	5.1
% Variable compensation	9777	0	100	10.94	0	22.22
Executive director appointments	13265	0	4	0.015	0	0.139
Board Size	13265	3	27	7.9	7	3.3
Meetings held	12394	0	42	6.7	6	5.3
% Board meetings attended	11704	8.9	100	66.6	66.7	15.2
CEO - Chairman duality	13265	0	1	0.284	0	0.451
% Promoter directors	13189	0	100	20.3	18.2	19.3
Volatility	11593	0	1.049	0.041	0.040	0.017
Sales (in INR million)	11404	0.1	330003	9946	1104	7786
ROA	12791	-6.9	25.2	0.094	0.076	2.4
R & D Expenditure/Assets	12791	0	0.905	0.003	0	0.021
Zero Dividend Dummy	13240	0	1	0.483	0	0.500
% Promoters holding	12369	0	98.9	49.8	51.3	19.5

Table 4: Before and After the Satyam Fiasco – A snapshot

The table shows the change in the variables from pre-Satyam fiasco period to post-Satyam fiasco period. The first column shows the variable names, the second columns shows the average values of the variables over the period 2006-08, the third column shows the average values of the variables over the period 2009-10, and the fourth column shows the percentage change along with its statistical significance. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively, where the standard errors are *clustered by firm*. The sample contains 2653 BSE-listed firms over the period 2006-10.

Variable	2006-08	2009-10	% Change
% IDs	50.5	51.1	1.18**
ID exits per year	0.299	0.360	20.4***
% Expert IDs	76.5	75.7	-1.04*
log(1 + Total Remuneration per Director)	9.7	10.9	12.6***
Meetings held	6.68	6.70	0.29
% Board meetings attended	65.8	67.6	2.8***
CEO - Chairman duality	0.285	0.282	-0.86
% Promoter directors	21.2	19.1	-9.9***
Board Size	7.7	8.2	6.4***
% EDs	27.13	31.47	16.0*
Executive director appointments in a year	0.008	0.026	234.4***
% Expert EDs	11.06	15.74	42.4***

Table 5: Effect of the Satyam fiasco on ID Exits

This table shows the effect of Satyam fiasco on the ID exits from Indian corporate boards. Columns 1, 2 show the effect on the ID exits while column 3 shows the effect on exits by ID exits normalized by the size of the board. The time period for all the tests in Panel B sample covers the years 2006 - 2010. The PostSatyam equals one for $t \geq 2009$ equals zero for $t < 2009$. 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 (i,t)		ID Exits (i,t) / Board Size (i,t)
	(1)	(2)	(3)
PostSatyam (t)	0.028*	0.041**	0.005**
	(0.014)	(0.017)	(0.002)
Volatility (i,t)	-1.165**	-0.646	-0.056
	(0.484)	(0.455)	(0.052)
log(Sales) (i,t)	0.052***	0.006	-0.000
	(0.004)	(0.016)	(0.002)
ROA (i,t)	-0.015	-0.010	-0.001
	(0.015)	(0.011)	(0.001)
R & D Expenditure/Assets (i,t)	-0.247	-0.538	-0.024
	(0.191)	(0.632)	(0.050)
Zero dividend dummy (i,t)	0.075***	0.096***	0.009**
	(0.019)	(0.036)	(0.004)
Promoters holding (%) (i,t)	-0.002***	-0.002	-0.000
	(0.001)	(0.002)	(0.000)
Constant	0.210***	0.390***	0.047***
	(0.042)	(0.108)	(0.013)
Firm FE	No	Yes	Yes
Observations	9,900	9,900	9881
R^2	0.129	0.345	0.310

Table 6: Effect of the Satyam fiasco on the percentage of IDs on Indian boards

The table shows the effect of Satyam fiasco on the percentage of IDs on Indian corporate boards. Columns 1-2 show the results using the full sample (2006 – 2010) while Column 3 and 4 show the results using sample periods 2008 – 2010 and 2007 – 2008 respectively. The PostSatyam equals one for t ≥ 2009 equals zero for t < 2009. The Financial Crisis Start Dummy 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:	% IDs			
Sample:	2006-10	2006-10	2008-10	2007-08
	(1)	(2)	(3)	(4)
PostSatyam (t)	-0.473*	-0.629***	-0.684**	
	(0.250)	(0.239)	(0.266)	
Financial Crisis Start Dummy (t)				0.230
				(0.237)
Volatility (i,t)	11.077	1.583	39.444	24.291
	(10.039)	(7.125)	(26.384)	(33.126)
log(Sales) (i,t)	0.360***	0.247	0.398***	0.420**
	(0.136)	(0.269)	(0.144)	(0.175)
ROA (i,t)	-1.081***	-0.156	-0.940***	-5.481***
	(0.218)	(0.204)	(0.078)	(2.028)
R & D Expenditure/Assets (i,t)	12.774	-9.040	7.614	19.470*
	(7.807)	(7.937)	(6.307)	(11.076)
Zero dividend dummy (i,t)	-0.010	-0.423	0.067	-0.402
	(0.554)	(0.447)	(0.584)	(0.695)
Promoters holding (%) (i,t)	-0.079***	-0.023	-0.065***	-0.094***
	(0.016)	(0.026)	(0.017)	(0.018)
Constant	53.816***	52.163***	51.949***	54.174***
	(1.277)	(1.856)	(1.661)	(2.104)
Firm FE	No	Yes	No	No
Observations	9,881	9,881	6,109	4,037
R^2	0.113	0.833	0.112	0.119

Table 7: Difference-in-difference estimate of the effect of the Satyam fiasco on the percentage of IDs

The table shows the effect of Satyam fiasco on the percentage of IDs on Indian corporate boards depending on whether the firm performance was high or low. The sample covers the time period from 2006 to 2010. The PostSatyam equals one for t ≥ 2009 equals zero for t < 2009. High ROA, High sales growth, High profit margin are dummies that equal one if the firm ranked about the median with respect to the performance measure used. 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:	% IDs(i,t)			
Sample:	2006-10	2006-10	2006-10	2006-10
	(1)	(2)	(3)	(4)
Post Satyam Dummy(t) * High ROA (i,t-1)	1.778***			
	(0.480)			
Post Satyam Dummy(t) * High sales growth (i,t-1)		1.018**		
		(0.436)		
Post Satyam Dummy(t) * High profit margin (i,t-1)			0.587*	
			(0.351)	
Post Satyam Dummy(t) *Accruals (i,t-1)				-0.471*
				(0.273)
High ROA (i,t-1)	-0.957***			
	(0.328)			
High sales growth (i,t-1)		-0.066		
		(0.277)		
High profit margin (i,t-1)			-1.120**	
			(0.516)	
Accruals (i,t-1)				0.054
				(0.067)
Constant	50.035***	49.493***	50.181***	51.060***
	(0.285)	(0.224)	(0.381)	(0.204)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	13,189	13,189	13,189	10,535
R^2	0.785	0.785	0.785	0.834

Table 8: Effect of the Satyam fiasco on the percentage of expert IDs on Indian boards

The table shows the effect of Satyam fiasco on the percentage of expert IDs on Indian corporate boards. Columns 1-2 show the results using the full sample (2006 – 2010) while Column 3 and 4 show the results using sample periods 2008 – 2010 and 2007 – 2008 respectively. We label a director to be an expert by searching for his educational qualification as well as his occupation: a director is defined to be an expert if (s)he is a civil servant, possesses a business or a law degree, is a practicing lawyer, PhD or an academic. The PostSatyam equals one for $t \geq 2009$ equals zero for $t < 2009$. The Financial Crisis Start Dummy 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 (i,t)				
	2006-10	2006-10	2008-10	2007-08	2006-10
	(1)	(2)	(3)	(4)	(5)
PostSatyam (t)	-0.952***	-0.689**	-0.333*		
	(0.368)	(0.316)	(0.191)		
Financial Crisis Start Dummy (t)				-0.265	
				(0.326)	
Post Satyam dummy * Number of ID exits (i,t)					-0.593*
					(0.344)
Number of ID exits (i,t)					-0.346
					(-0.315)
Volatility (i,t)	-35.370	-1.075	-135.696***	-66.484	
	(22.139)	(7.631)	(49.553)	(55.948)	
log(Sales) (i,t)	0.753***	-0.053	0.684***	0.552**	
	(0.227)	(0.268)	(0.239)	(0.274)	
ROA (i,t)	-3.134	1.091	-6.241**	0.958	
	(2.150)	(0.998)	(2.478)	(3.058)	
R & D Expenditure/Assets (i,t)	14.711	-16.646	5.746	21.245	
	(14.264)	(10.681)	(11.454)	(17.611)	
Zero dividend dummy (i,t)	-2.220**	-0.704	-2.860**	-1.843	
	(1.040)	(0.522)	(1.118)	(1.258)	
Promoters holding (%) (i,t)	0.111***	0.024	0.110***	0.121***	
	(0.027)	(0.034)	(0.028)	(0.031)	
Constant	70.265***	75.953***	74.792***	71.425***	76.234***
	(2.170)	(2.159)	(2.865)	(3.323)	(0.227)
Firm FE	No	Yes	No	No	Yes
Year FE	No	No	No	No	Yes
Observations	9,739	9,739	6,038	3,976	12,725
R^2	0.121	0.910	0.123	0.120	0.902

Table 9: Effect of the Satyam fiasco on the compensation of directors on Indian corporate boards

The table shows the effect of Satyam fiasco on the compensation of Directors on Indian corporate boards. Panel A shows the results for all directors while Panel B shows the results only for IDs. The PostSatyam equals one for t ≥ 2009 equals zero for t < 2009. The Financial Crisis Start Dummy 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.

Panel A

Dependent variable:	Log (Remuneration per director) (i,t)				% Variable pay (i,t)	Log (Remuneration per director) (i,t)	Log (Remuneration per director/Avg. board meetings attended) (i,t)
Sample:	2006-10	2006-10	2008-10	2007-08	2006-10	2006-10	2006-10
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PostSatyam (t)	0.752***	0.760***	0.539***		-1.219***		0.443**
	(0.074)	(0.074)	(0.083)		(0.424)		(0.029)
Financial Crisis Start Dummy (t)				0.452			
				(0.823)			
PostSatyam (t) * % Expert Directors (i,t)						0.093**	
						(0.042)	
% Expert Directors (i,t)						0.002	
						(0.004)	
Volatility (i,t)	-11.192*	-5.840	-19.977**	-12.945	-15.15	-7.980	-3.366
	(6.768)	(3.778)	(7.912)	(9.735)	(13.17)	(5.982)	(2.206)
log(Sales) (i,t)	0.731***	0.518***	0.715***	0.752***	1.778***	0.702***	0.144***
	(0.037)	(0.085)	(0.038)	(0.045)	(0.495)	(0.037)	(0.011)
ROA (i,t)	0.791**	0.166	1.158**	0.807**	5.176***	0.825*	0.172*
	(0.322)	(0.346)	(0.457)	(0.399)	(1.394)	(0.498)	(0.102)
R&D Expenditure/Assets (i,t)	10.576***	-0.952	9.871***	11.451***	33.23	10.515***	2.492***
	(2.055)	(3.317)	(2.162)	(2.341)	(32.98)	(2.354)	(0.696)
Zero dividend dummy (i,t)	-1.120***	-0.083	-1.100***	-1.345***	-6.491***	-1.127***	-0.180***
	(0.159)	(0.162)	(0.168)	(0.199)	(0.929)	(0.161)	(0.049)
Promoters holding (%)(i,t)	0.008*	-0.002	0.011**	0.008	-0.045	0.007	0.005***
	(0.004)	(0.007)	(0.005)	(0.005)	(0.028)	(0.004)	(0.001)
Constant	7.947***	8.798***	8.431***	8.218***	7.690**	7.333***	1.602***
	(0.436)	(0.555)	(0.472)	(0.558)	(3.109)	(0.523)	(0.137)
Firm FE	No	Yes	No	No	Yes	No	No
Year FE	No	No	No	No	No	Yes	No
Observations	9,732	9,732	6,052	3,994	8,274	9,454	9,732
R^2	0.231	0.800	0.237	0.251	0.888	0.218	0.098

Panel B

Dependent variable:	log (Remuneration per ID) (i,t)				log (Remuneration per ID/Avg. board meetings attended by IDs) (i,t)
	2006-10	2006-10	2008-10	2007-08	2006-10
	(1)	(2)	(3)	(4)	(5)
PostSatyam (t)	0.384***	0.453***	0.274***		0.453***
	(0.097)	(0.104)	(0.102)		(0.104)
Financial Crisis Start Dummy (t)				0.131	
				(0.112)	
Volatility (i,t)	-7.900	-10.976**	-8.987	-6.770	-10.976**
	(5.748)	(5.370)	(7.340)	(11.134)	(5.365)
log(Sales) (i,t)	0.140***	-0.076	0.124***	0.127***	-0.076
	(0.037)	(0.076)	(0.038)	(0.045)	(0.076)
ROA (i,t)	-0.161	-0.020	-0.212	0.245	-0.020
	(0.181)	(0.065)	(0.176)	(0.476)	(0.065)
R&D Expenditure/Assets (i,t)	5.903	1.187	6.801***	5.037**	1.187
	(3.827)	(0.747)	(2.518)	(2.243)	(0.746)
Zero dividend dummy (i,t)	-0.788***	-0.492*	-0.834***	-0.923***	-0.492*
	(0.177)	(0.266)	(0.194)	(0.242)	(0.266)
Promoters holding (%)	-0.380	0.826	-0.226	-1.099**	0.826
	(0.413)	(0.830)	(0.446)	(0.524)	(0.829)
Constant	-3.400***	-3.201***	-3.234***	-2.997***	-4.653***
	(0.421)	(0.616)	(0.449)	(0.614)	(0.615)
Firm FE	No	Yes	No	No	Yes
Year FE	No	No	No	No	No
Observations	518	518	354	204	518
R^2	0.224	0.873	0.197	0.259	0.876

Table 10: Effect of the Satyam fiasco on monitoring by IDs

The table shows the effect of satyam fiasco on monitoring by IDs in a firm using panel data for BSE-listed firms from 2007-2009. The variable 'Post Satyam fiasco dummy' takes a value of one in 2009 and zero otherwise. Robust standard errors clustered at the firm level are shown in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Dependant variable is:	Number of board meetings held		% of meetings attended by all directors		% of meetings attended by outside directors		% Executive Chairmen	% Promoter Directors
	(1)	(2)	(1)	(2)	(3)	(4)		
PostSatyam (t)	1.144***	1.344**	0.796**	0.541*	0.949**	0.824*	-0.006***	-1.324***
	(0.398)	(0.598)	(0.317)	(0.284)	(0.414)	(0.434)	(0.002)	(0.154)
Volatility (i,t)		-26.104		-0.521		0.009	0.085	-1.324***
		(20.253)		(0.890)		(1.211)	(0.082)	(0.154)
log(Sales) (i,t)		0.365		-0.291		-0.749	-0.001	6.547
		(0.300)		(1.332)		(1.582)	(0.002)	(4.750)
ROA (i,t)		0.200		2.337		1.979	-0.000	-0.282**
		(1.356)		(2.586)		(3.238)	(0.001)	(0.137)
R&D Expenditure/ Assets (i,t)		8.748		-2.922		-4.454	-0.006	-0.191***
		(13.858)		(5.299)		(11.717)	(0.022)	(0.072)
Zero dividend dummy (i,t)		-0.225		-0.633		-0.983	-0.003	-6.421
		(0.591)		(0.481)		(0.661)	(0.004)	(4.524)
Promoters holding (%) (i,t)		-0.006		-0.002		0.028	-0.000	-0.136
		(0.028)		(0.049)		(0.075)	(0.000)	(0.289)
Constant	65.232***	65.147***	68.232***	69.268***	69.083***	69.727***	0.300***	22.732***
	(0.117)	(2.190)	(0.107)	(3.694)	(0.140)	(4.982)	(0.014)	(1.102)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,053	9,456	8,053	5,392	8,027	5,371	9,900	9,881
R^2	0.717	0.637	0.717	0.722	0.693	0.701	0.984	0.950

Table 11: Substitution of ID monitoring through other mechanisms

This table shows the effect of Satyam fiasco on board size, the percentage of EDs, number of ED appointments and the percentage of expert EDs. We label a director to be an expert by searching for his educational qualification as well as his occupation: a director is defined to be an expert if (s)he is a civil servant, possesses a business or a law degree, is a practicing lawyer, PhD or an academic. The PostSatyam dummy equals one for $t \geq 2009$ equals zero for $t < 2009$. 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:	Board Size (1)	% EDs (2)	ED Appointments (3)	% Expert EDs (4)
PostSatyam (t)	0.214***	0.226***	0.015***	0.671***
	(0.040)	(0.040)	(0.003)	(0.163)
Volatility (i,t)	-3.207***	-0.590	-0.041	-2.705
	(1.231)	(1.079)	(0.068)	(4.716)
log(Sales) (i,t)	0.140***	0.077***	0.005**	0.151
	(0.039)	(0.030)	(0.002)	(0.121)
ROA (i,t)	0.012	-0.004	-0.001	-0.005
	(0.016)	(0.005)	(0.000)	(0.017)
R&D Expenditure/ Assets (i,t)	0.619	1.299	0.055	-6.600
	(1.194)	(1.515)	(0.102)	(7.929)
Zero dividend dummy (i,t)	-0.087	0.100	0.008	0.221
	(0.071)	(0.089)	(0.009)	(0.262)
Promoters holding (%) (i,t)	0.006	-0.004	0.000	-0.006
	(0.004)	(0.007)	(0.000)	(0.015)
Constant	7.460***	0.446	-0.028	2.122***
	(0.265)	(0.398)	(0.020)	(0.790)
Firm FE	Yes	Yes	Yes	Yes
Year FE	No	No	No	No
Observations	9,900	9,900	9,900	9,900
R^2	0.877	0.901	0.284	0.916

Table 12: Effect of ID resignations following Satyam fiasco on ex-post firm performance

This table presents results of difference-in-difference tests for the effect of ID resignations following the Satyam fiasco on ex-post measures of firm performance (ROA, Profit Margin, Tobin's Q). Post Satyam Dummy(t-1) equals one for t = 2010 and equals zero for $2007 \leq t < 2010$. The interaction of Post Satyam Dummy(t-1) with ID exits (t-1) captures the before-after difference in next year's firm performance for treatment firms, where ID exited, minus this difference for the control group of firms, where there was no ID exits. We estimate robust standard errors that are *clustered by firm*. ***, ** and * denote statistical significance at 1%, 5% and 10% respectively.

Dependent Variable:	(1) ROA(i,t)	(2) Profit Margin (i,t)	(3) Tobin's Q (i,t)
ID Exits(t-1)*Post Satyam Dummy(t-1)	-0.052	-3.630	-0.032
	(0.035)	(3.805)	(0.057)
ID Exits (t-1)	0.006	-0.165	-0.023
	(0.012)	(2.295)	(0.033)
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	10,216	8,993	9,848
R^2	0.474	0.633	0.794

Appendix: Definition of an Independent Director according to Clause 49 of the stock exchange

listing agreement promulgated by the Securities and Exchange Board of India (SEBI) in 2000

The expression independent director shall mean a non-executive director of the company who:

1. Apart from receiving director's remuneration, does not have any material pecuniary relationships or transactions with the company, its promoters, its directors, its senior management or its holding company, its subsidiaries and associates that may affect independence of the director.

2. Is not related to promoters or persons occupying management positions at the board level or at one level below the board.

3. Has not been an executive of the company in the immediately preceding three financial years.

4. Is not a partner or an executive or was not partner or an executive during the preceding three years, of any of the following:

the statutory audit firm or the internal audit firm that is associated with the company; and

the legal firm(s) and consulting firm(s) that have a material association with the company.

5. Is not a material supplier, service provider or customer or a lessor or lessee of the company, which may affect independence of the director.

6. Is not a substantial shareholder of the company i.e. own more than 2 percent of the voting shares.

Explanations are:

Associate shall mean a company which is an associate as defined in Accounting Standard (AS) 23, Accounting for Investments in Associates in Consolidated Financial Statements, issued by the Institute of Chartered Accountants of India.

''Senior management'' shall mean personnel of the company who are members of its core management team excluding the board of directors. Normally, this would comprise all members of management one level below the executive directors, including all functional heads.

''Relative'' shall mean ''relative'' as defined in section 2(41) and section 6 read with Schedule IA of the Companies Act, 1956.

Nominee directors appointed by an institution, which has invested in or lent to the company shall be deemed to be independent directors. (Institution for this purpose means a public financial institution as defined in Section 4A of the Companies Act, 1956 or a corresponding new bank as defined in section 2(d) of the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1970 or the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1980 (both Acts).

Source: Securities and Exchange Board of India (SEBI)