After the Storm: The "Unregulated" Effect of a Corporate Governance Failure on the Market for Directors

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Abstract

We investigate how a major corporate governance failure affects the market for corporate directors. Using a unique, hand-collected dataset of individual director and board characteristics for more than 2,500 Indian public companies, we examine the effect of a corporate governance failure at India's fourth largest software company, Satyam Computers in January 2009, on corporate boards in *other* Indian firms. The failure increased risks stemming from being an independent director in Indian firms. Consistent with this supply-side shock in the market for independent directors (IDs), we find that following the fiasco: (i) IDs exited in large numbers from other Indian firms resulting in an overall decrease in the percentage of IDs in corporate boards; (ii) the quality of IDs, as measured by their educational qualifications and professional experience, declined; (iii) director compensation, in particular fixed compensation, increased.

Consistent with the market interpreting ID exits as a negative signal about the firm, we find a negative stock price reaction to ID exits. This reaction is disproportionately more when the ID sat on the audit committee of the board and possessed business expertise. The failure also highlighted the ineffectiveness of monitoring by IDs. We examine whether monitoring by IDs was substituted through other channels and find that board size and attendance in board meetings increased. Furthermore, we find evidence consistent with an increase in the voices of insiders on the board. Consistent with such substitution of monitoring through other channels, we find no differences in ex post performance in firms from which IDs exited vis-à-vis those from which IDs did not exit.

Key Words: Board of Directors, Corporate Governance, Independent Directors

JEL Codes: G34

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1. Introduction

High profile corporate governance failures have prompted sweeping corporate governance legislation like the Sarbannes-Oaxley and the adoption of standards like those by the OECD around the world. Many of these regulatory changes have focused on reforming the composition and quality of the board of directors as a major step in fixing the problem. Linck et al (2009), for instance, document significant changes in board size, independence and director pay in the aftermath of the Sarbannes-Oaxley legislation.

Apart from spurring legislative action however, prominent corporate governance failures can significantly affect the market for directors by changing the risk-return tradeoff of existing and potential board members. On the supply side of directorial services, a major fiasco brings in its wake significant legal harassment and public humiliation for the independent directors (IDs) involved and can restrict their supply. As well, a prominent failure of the existing board as a monitoring agency may negatively affect the faith companies and investors put on IDs as diligent monitors; consequently, the demand for IDs may decline. What is the final combined outcome of these effects on corporate boards? What happens to the balance between independent and executive directors on the board? Equally importantly, since directors may vary significantly in quality, what is the effect of such a crisis on the overall quality of boards?

We can only answer these questions if we can find a case where a high-profile corporate governance failure had a market-wide impact but was not accompanied by any regulatory change in response. Such an event can enable us to study the "unregulated" effect of corporate governance failures on the market for corporate directors. The corporate governance crisis in India, which was precipitated by the revelation of a long-standing accounting fraud at the fourth largest Indian software firm, Satyam computers, provides us precisely such an opportunity. In two events that were separated in time by three weeks, Satyam computers drew national headlines and international attention. First, on 16th Dec 2008, Satyam's board – which comprised of world-class academics, technologists and former policy makers as its external directors – unanimously approved a self-dealing transaction by its promoters only to backtrack within a few hours when heavily opposed by institutional investors. Second, on 7th Jan 2009, Satyam's founder and Chairman Ramalinga Raju admitted to a five-year-old accounting fraud and fictitious cash balances to the tune of over US $1 billion. The shock reverberated through the economy as the benchmark market indices – BSE Sensex and Nifty - fell by 7.25% and 6.18% respectively that day. After the federal government superseded Satyam's board and initiated investigative and regulatory actions against its board members, IDs in India became starkly aware of the risks involved in the position. The failure of the high-profile Satyam board cast doubts not only on the particular set of people but also on the efficacy of the institution of IDs. Worried that a

lifetime's reputation could be tarnished because of the hard-to-detect actions of unscrupulous insiders, IDs resigned en masse from *other* corporate boards (see Figure 1 below).[1]

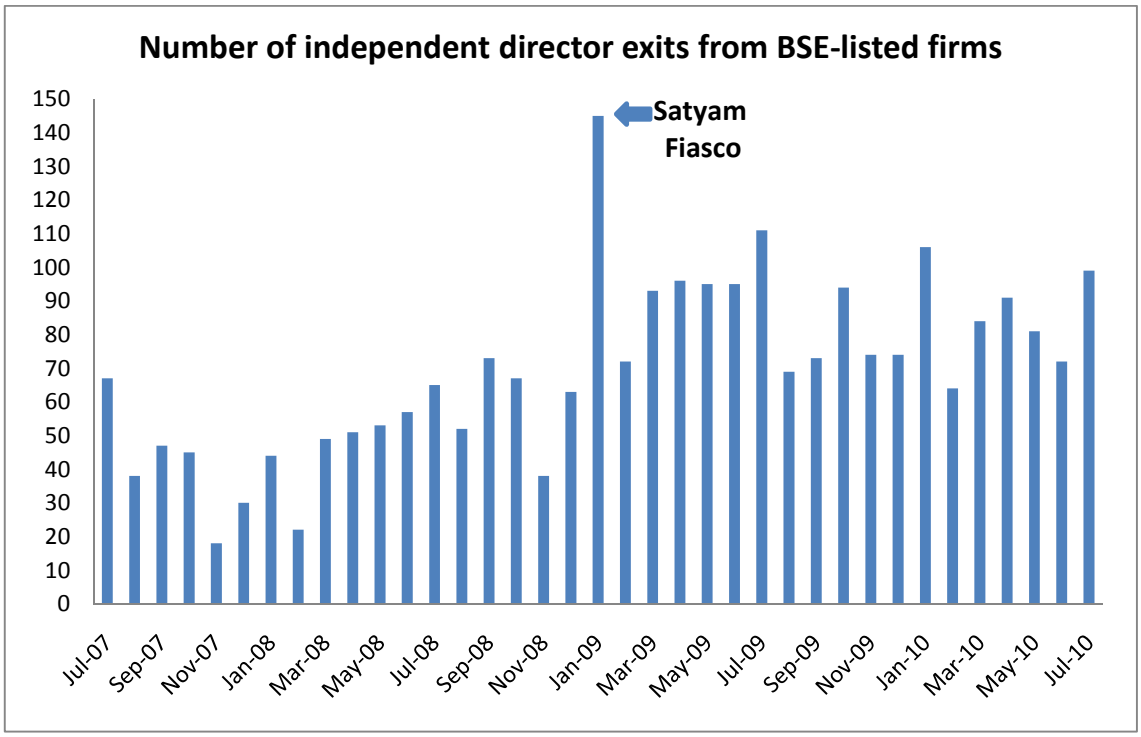

Figure 1: Exodus of IDs from Indian listed firms Jul '07 to Jul '10

This setting provides us with an opportunity to investigate how a major corporate governance failure affects the market for corporate directors. Using a unique, hand-collected dataset of individual director and board characteristics for more than 2,500 Indian public companies, we examine the effect of the Satyam fiasco on corporate boards in *other* Indian firms. Consistent with a supply-side shock in the labour market for IDs, we find that following the fiasco IDs exited in large numbers from other Indian firms resulting in an overall decrease in the percentage of IDs on corporate boards. The decrease in board independence was disproportionately more in firms that were a priori performing poorly. However, we find no evidence to indicate that IDs exited more from firms that undertook accounting manipulation. This is consistent with IDs fearing downside risks in the firms that they were associated with.

Even more interesting than these effects are perhaps those on the quality of IDs. IDs are now less likely to have relevant educational backgrounds (such as being equipped with a business or a law degree) or professional experience (including lawyers, financial experts, academics, civil servants and others government officials).

[1] A prominent Indian shareholder activist Prithvi Haldea notes: "……Many (IDs) 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?"

Apart from increasing the risks of being an ID, the Satyam fiasco also highlighted the ineffectiveness of monitoring by IDs, which may have reduced the demand for IDs. While reduced demand and enhanced supply work in tandem to reduce board independence (quantity), their effects on independent director compensation (price) oppose each other. However, since the stock exchange listing requirements mandate firms to maintain a certain threshold percentage of independent directors, the demand for independent directors may be relatively inelastic. By examining the effect on director compensation, we infer which of these two opposing theoretical predictions is best supported empirically. We find evidence of significant increases in independent director remuneration following the Satyam crisis. Though workload, as measured by the attendance in board meetings, has increased, we find that the increase in compensation is above and beyond that accounted for by the increase in workload, which we interpret as being consistent with the fact that the supply-side effect dominates the effect of a relatively inelastic demand.

We consider the alternate hypothesis that the above changes were caused by the onset of the financial crisis and not by the Satyam fiasco. Figure 1 above, which shows that the large scale exits by IDs happened in January 2009 coinciding with the month of the Satyam fiasco, casts doubt on this alternative hypothesis. Nevertheless, since the Lehman failure that happened in September 2008 precipitated the financial crisis, we can refute this alternative hypothesis since we find no statistically significant change in 2008 vis-à-vis that in 2007 for any of the above variables.

We then examine the stock market reaction to the ID exits. We restrict attention to those exits that occurred in January 2009 since these exits are unlikely to have been confounded by other factors. Consistent with the market interpreting ID exits as a negative signal about the firm, we find a negative stock price reaction to ID exits. This reaction is disproportionately more when the ID sat on the audit committee of the board and possessed business expertise.

Next, we examine whether monitoring by IDs was substituted through other channels and find that board size and attendance in board meetings increased. Furthermore, the crisis also seems to have sparked changes that are consistent with greater reliance on internal governance. First, appointment of executive directors increased resulting in a higher percentage of executive directors on the board despite an overall increase in board size. This increase in percentage of executive directors has to be seen in the light of the fact that in order to maintain the threshold level of IDs on the boards when IDs were leaving in large numbers, firms would've had to let go of their executive directors from the board. Against this backdrop of an expected mechanical decrease in the percentage of executive directors stemming from compliance requirements, the increase is noteworthy. Second, chairmen holding executive positions decreased. Third, appointment of executive directors has increased *disproportionately* more in firms where the chairman held an executive position as well. Since the threshold level of independence required for firms where the chairman holds an executive position as well is higher (50%) when compared to firms where the chairman does not hold an executive position (33%), these appointments are consistent with firms focusing on strengthening

internal governance when the quality of IDs available declined. It appears that companies are now 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. (forthcoming) that internal governance can mitigate agency problems when the potential reaction of subordinates can limit the self-serving actions of top management.

Consistent with such substitution of monitoring through other channels, we find no differences in ex post performance in firms from which IDs exited vis-à-vis those from which IDs did not exit.

The paper contributes to the literature on corporate governance and specifically to the market for corporate directors. By studying the effects of a well-known corporate governance failure that led to exogenous changes in the boards of other firms but was not accompanied by a regulatory response, we are able to pinpoint the unadulterated effects of a corporate governance failure on the market for directors. Then by examining the other channels through which firms substitute reduced monitoring by IDs, we highlight the self-correcting responses of firms in the absence of regulation. When juxtaposed with our finding that the ex post performance of firms from which IDs exited is no different from those from which IDs did not exit, these results suggest that trigger-happy regulatory responses to corporate governance failures may not be necessary.

2. Background

2.1 The corporate governance scandal at Satyam

Satyam Computer Services Limited (SCL), the Hyderabad-based Indian software company was founded in 1987 by B Ramalinga Raju and his brother B Rama Raju. In the two decades 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's chairman, B Ramalinga Raju, had acquired a stellar reputation as an entrepreneur, corporate citizen and media personality.[2] 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. The non-executive directors on its board included leading academics from India and abroad such as Prof. Krishna Palepu of Harvard Business School – who was an authority on corporate governance, the then Dean of the Indian School of Business, industry experts such as Vinod Dhams – 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

[3] Raju had served as 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. Among the many awards that he had received, 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.

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 Ramalinga Raju 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 much-vaunted $1.2 billion cash holding was largely non-existent; the cash holding was the result of a long-drawn accounting fraud.[3] 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 (4.43% and 4.19% respectively after removing the effect of Satyam).

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.[4]

2.2 Costs and benefits of directorship positions

Fama (1980) and Fama and Jensen (1983) argued that prestige, networking, and learning opportunities are primary reasons why individuals serve as outside directors on corporate boards. They also contend that the labour market for outside directors functions on the basis of reputation; several empirical studies support their contention.[5] 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.[6]

When deciding whether to resign, a director trades off the benefits from continuing to serve on the board against the costs of the same. Directorship provides several important benefits: business

[3] 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.

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

[5] For instance, Brickley, Linck, and Coles (1999) show that CEOs who perform well in the year before retirement receive more directorships following their retirement. Ferris, Jagannathan, and Pritchard (2003) show that firm performance positively affects the number of appointments held by a director. On the other hand, CEOs of firms who cut dividends (Kaplan and Reishus (1990)), directors who resign following bankruptcy filing (Gilson (1990)) and directors of firms that restate earnings (Srinivasan (2005)) are likely to receive relatively fewer directorships.

[6] There are financial incentives for performance as well. Yermack (2004) shows that for non-executive members of S&P 500 boards, there is, on average, a $285,000 change in wealth for one standard deviation improvement in firm performance, roughly a gain of 11 cents per $1,000 rise in firm value. In terms of risks associated with directorships, Black, Cheffins, and Klausner (2005) find that directors of public companies experience a very low risk of out-of-pocket liability not only in the USA but also in Britain, Canada and Australia. A recent exception to this is the January 2005 settlement by outside directors of Enron and WorldCom to pay $31 million dollars out of their pockets.

relationship, learning business practices from high quality managers, opportunity to contribute to society (Lorsch and MacIver 1989), reputation as an expert in decision control and monitoring, which is likely to be rewarded with additional board appointments and benefits (Fama and Jensen 1983), and compensation.

While a directorship position provides non-trivial benefits, it entails direct costs in the form of time and effort commitments, and indirect costs such as the risk of reputational damage and potential legal liabilities. As Fama (1980) and Fama and Jensen (1983) argue, directors have strong incentives to maintain a good reputation as business persons and monitors because reputation manifests itself in additional board seats and increased repute apart from the accompanying compensation.

2.3 **Potential legal liabilities of IDs in the post-Satyam scenario**

While potential legal liabilities may pose insignificant costs to directors in the context of a developed market, the possibility of civil and/or criminal liabilities posed a significant cost to Indian IDs after the Satyam fiasco. This is particularly so because neither listing standards in the Indian stock exchanges nor The Indian Companies Act (1956) differentiate the role of external directors vis-à-vis that of the internal (executive) directors, promoter-affiliated directors or the nominee directors. Furthermore, neither listing standards nor The Indian Companies Act defines the legal liabilities faced by IDs with any real precision. In fact, in his interviews of Indian IDs post the Satyam fiasco, Khanna (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 imposed and was not offset by adequate directors' and officers' insurance coverage." [7] Furthermore, Khanna (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."

Indian IDs' fear of legal liabilities in 2009 is best illustrated by the experience of Nimesh Kampani, one of India's leading investment bankers. Kampani had served as an ID on the board of Nagarjuna Finance Limited for approximately one year from 1998 to 1999. The promoters and executives of Nagarjuna Finance Limited were later charged for failing to repay depositors nearly US $20 million during 2001-02. Surprisingly however, the particular state government also laid criminal charges against Kampani, who had left the board long prior to any of the allegations surfaced. Kampani managed to avoid arrest and jail time by remaining in Dubai for nine months until a state court in October 2009 stayed the proceedings against him.

[7] Criminal liabilities on external directors can be brought about under the aegis of the clause 49 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 liabilities may trigger arrests and, potentially, convictions for directors.

2.4 An "unregulated" corporate governance failure that was exogenous to other firms

The Satyam fiasco provides us with a clean, "unregulated" corporate governance failure that was *exogenous* to the other firms. First, the scandal was completely unexpected before it happened. Second, since the scandal involved a firm that was quite feted for its corporate governance practices and was in an industry that has been the internationally recognized "poster child" for its professionalism and competition, the corporate governance shock came from a completely unexpected quarter. As a result, we do not expect any effect on the variables of interest before the scandal. Third, 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. Fourth, not only was the scandal big enough to rock the Indian market on both days, this incident led to a re-assessment of risks associated with being an ID in India. Fifth, any changes in the boards of other firms are unlikely to be driven by firm-specific unobserved 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. Thus, these changes were exogenous to the firms in question. Finally, since the Indian regulators did not respond to the Satyam fiasco by enacting any new legislation or regulation, the event provides us a natural experiment to examine the pure, unregulated effect of a corporate governance failure on the market for independent directors.

2.5 Mandatory board independence requirements in India

A key regulatory change that affected the characteristics of Board of Directors in Indian firms was the promulgation of clause 49 of the stock exchange listing agreement in 2000 by the Securities and Exchange Board of India (SEBI). 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. Data description

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

3.1 Board and director characteristics

Using the mandatory filings made to the Bombay Stock Exchange (BSE) by listed companies, we generate 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.[8] 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 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.

Although the Directors Database (www.directorsdatabase.com) maintains all this information by compiling the regulatory filings made by clause 49 compliant companies listed at the BSE,[9] the information is not available in an easily accessible format. To collate and code this data into an accessible format, we employed a web automation tool to scrape the data from the Directors Database website together with a keyword search.

Apart from the board characteristics, for each individual director, we extracted the educational background, current profession and job title as reported in the Directors' Database. We undertook a keyword search on each individual director's educational background to capture whether a director possessed a business or a law degree. For a business degree, we searched for the words: (i) "M.B.A." and its variants such as "Masters in Business Administration"; (ii) "Post Graduate Diploma in Business Management" and its variant "PGDM"; (iii) "Bachelor in Commerce" and its variants such as "B.Com"; (iv) "Chartered Accountant" or "CA"; and (v) "Chartered Financial Analyst" or "CFA". For a law degree, we searched for the words: (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. Similarly, a key word search on the 'occupation' field enables us to create indicator variables to qualify directors as: (i) lawyers by profession ("Legal Counsel", "Lawyer", "Advocate" etc.); (ii) Academics ("Lecturer", "Reader", "Professor", "Faculty", "Dean", "Vice Chancellor", etc.); (iii) Government officials ("Secretary", "Government of India", etc.).

3.2 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

[8] This set excludes the suspended/Z Group companies, which are BSE listed companies that do not have to Comply with clause 49.
[9] The Directors Database was created under the initiative of the BSE by Prime Database of India.

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.

3.3 **Regression variables**

Our variables of interest and the way they have been defined and measured are listed in Table 2 along with the source of the data. In particular, in terms of board characteristics, we focus on board size, board independence (proportion of IDs), the proportion of promoter directors (i.e. directors linked to the founding family of the firm's entrepreneurs), the proportion of executive directors and the Executive chairmen. We follow these figures on an annual basis over the period of our observation. In addition to these board-level characteristics, we also track the exits of IDs and appointments of executive directors in a given year. We also take into account the number of board meetings held in a year as well as the average attendance in these meetings. On the remuneration side, we track total remuneration per director. Finally, in order to understand the firm features driving the cross-sectional differences, we track firm risk as measured by the firm volatility, logarithm of sales as a measure of firm size, profitability as measured by the ROA, financial leverage as measured by the long term debt to assets, and R&D expenditure/assets to understand the research intensity of the firm. We also note if the firm is a dividend-paying firm and record the promoters' holding in the firm to factor in the ownership structure.

3.4 **Descriptive statistics**

The descriptive statistics for the variables used in the analysis are provided in Table 3. 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 in our sample 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 piece of information suggests that several firms in our sample have more IDs than legally mandated. Second, we notice that while a majority of the IDs in our sample fall in the high quality category (i.e. either possess business or law degrees or are lawyers, academics or civil servants by profession), a small minority of the executive directors fall in this high quality category. Third, the board of the median firm in our sample comprises of seven members while the average firm in the sample has about eight board members. Fourth, the board of the median firm in our sample met on average six times per year during our sample period while the average firm met close to seven times on average in a given year. 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 or 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 also happen to be 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.

To understand the movement over time of the key variables of interest, Figures 2-4 provide a visual representation of the annual averages (across all firms in our sample) of these 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 after. We also notice that the quality of 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 good quality 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 2000. 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 executive directors on the board increased substantially in 2010 after being primarily range bound in the years 2007 to 2009.

4. Results

At its core, our analysis is a comparison of board characteristics before and after the Satyam fiasco. We start off by taking a simple before-after look at the different variables of interest. Since the Satyam crisis occurred on January 8, we look at the period 2006 through 2008 as the "before" (pre-Satyam) period and the two years 2009 and 2010 for which we have data as the "after" (post-Satyam). Table 4 shows the average values of the dependent variables during 2006-08 and 2009-10 (i.e. pre-Satyam scam period to post-Satyam period); percentage change in them and the statistical significance for the percentage difference.

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 crisis: this difference is statistically significant at a 1% level. Second, the quality of the IDs as measured by their education and professional background has shown a statistically significant decline. In contrast, the quality of executive directors has witnessed a substantial increase. The directors are earning more after the crisis though this could just be a manifestation of the time trend in director compensation as 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.

At the broad level, the univariate analysis suggests that Indian boards after the Satyam crisis differ significantly from before along several dimensions.

4.1 The Supply-side View

In the Satyam fiasco, the promoter-chairman carried out a long standing accounting fraud with the cooperation of the auditor. Since IDs have to rely on the audited financial information provided by auditors and the auditor in this instance – Price Waterhouse Coopers – was culpable for perpetrating the fraud, the Satyam fiasco highlighted to IDs the risks due to the *hard-to-detect actions of insiders*. The Satyam fiasco thus engendered worries among the IDs that they could be put in jail, held legally liable and have their reputations tarnished beyond repair for actions perpetuated without their knowledge by insiders. An ID would resign from his/her position if the costs associated with the position outweighed the benefits from the same. Since the benefits associated with being an ID did not change due to the Satyam fiasco while the cost of supplying ID services increased substantially, the Satyam fiasco represents an exogenous shock to the supply of ID services. We now examine the various effects predicted by this supply-side shock.

4.1.1 Exits by independent directors

First, we predict that IDs would exit from *other* firms post the Satyam fiasco. 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. Since the ID exits where due to an economy wide shock, both the sharp increase in ID exits in January 2009 as well as the overall increase in the post-Satyam period occurred due to reasons that were exogenous to the given firms.

The pattern evidenced in figure 1 is also substantiated by the before-after comparison of the average number of ID exits in Table 4. 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:

$$ID\ exits(i,t) = \beta_0 + \beta_1 * Post\ Satyam\ fiasco\ dummy(t) + \beta * X(i,t) + \varepsilon(i,t) \quad (1)$$

where *Post Satyam fiasco dummy(t)* equals 1 for the years 2009 and 2010 and 0 for the years 2006-2008 and 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 are clause 49 compliant. 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.

Columns 1 and 2 of Table 5 show the results for regression equation (1). In column 1, 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 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).

The specification in column 2 is identical to that in column 1 except for the fact that it includes firm fixed effects as well, which enables us to control for unobserved firm-specific factors that may have motivated the exit. In both column 1 and 2, we find that post Satyam the exit by IDs has been positive and statistically significant. The economic effect is significant as well. Compared to the average number of independent director exits, which equals 0.323 from table 3, the increase of 0.041 in column 2 amounts to a 12.7% increase. Among the control variables, we find that the zero dividend dummy which proxies the extent of financial constraints in a firm is associated positively and significantly with ID exits suggesting that IDs exited more from firms that faced financial constraints.

4.1.2 Difference-in-difference estimates using ID exits minus exits by executive directors

Inside and outside directors face different trade-offs when deciding whether to stay on the board or resign. An inside director who resigns from the board most likely also has to resign from his job. Furthermore, since insiders do not face the risks that outsiders face with respect to being ignorant about negative firm prospects or negative firm-specific information, it is unlikely that the perception of risks faced by inside directors changed significantly post the Satyam fiasco. Therefore, using the category of executive directors as a control group, we can obtain a counterfactual estimate of ID exits in the absence of the Satyam fiasco. Using this counter factual estimate, we estimate the effect of the Satyam fiasco on ID exits as a difference-in-difference.

In columns 3 and 4 of Panel B of Table 5, we use the difference between exits by IDs and those by executive directors as the dependent variable. Therefore, the coefficient of the post Satyam fiasco dummy provides a difference-in-difference estimate. We find that in columns 3 and 4 the coefficient of the post Satyam fiasco dummy is positive and statistically significant in column 4. Even

though the coefficient is not statistically significant in column 3, it is quite reassuring to note that the coefficient is very similar to that observed in column 1. Similarly, by comparing the coefficients of the post Satyam fiasco dummy in columns 2 and 4, we find that the coefficient in column 4 is very close to that observed in column 2. These comparisons suggest that with respect to the director exits, the category of executive directors indeed seems to function as an effective control group. Thus, the coefficients in columns 3 and 4 provide a difference-in-difference estimate by comparing the post Satyam fiasco effect on independent director exits vis-à-vis a counterfactual estimate of these exits in the absence of the Satyam fiasco.

The difference between ID exits and executive director exits has also risen by 18.6% after the crisis – in other words, when compared to executive directors, IDs have shown a greater tendency to exit boards after the crisis rather than before. This just confirms empirically what figure 1 had indicated – there has indeed been a rush amongst IDs to quit from boards post-Satyam.

4.1.3 Board independence after the Satyam fiasco

In Table 3, we noticed that for the median firm in our sample, about 40% of the directors are independent while for the average firm in our sample about half the directors are independent. Since clause 49 requirements mandate that at least a third of the board has to be comprised of IDs, several firms in our sample have more IDs than legally mandated. Given the ID exits post the Satyam fiasco, therefore, we expect a reduction in the percentage of IDs on Indian corporate boards. Panel A of Table 6 shows the results of these tests.

In column 1, we include the post Satyam fiasco dummy as well as several control variables that have been suggested to be correlated with percentage of board independence by the existing literature. Linck, Netter, and Yang (2008) 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. Linck, Netter, and Yang (2008) 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, Netter, and Yang (2008) 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, Netter, and Yang (2008), 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, Netter, and Yang (2008) 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. They 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 publicly traded and private 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.[10] Specifically in the Indian context, Bertrand, *et al.* (2002) find that owners of business groups expropriate minority shareholders by tunnelling resources from firms where they have low cash flow rights to firms where they have high cash flow rights; such tunnelling occurs primarily through the nonoperating components of profit.[11] Therefore, we include the proportion of equity held by the promoter to proxy agency costs in Indian family-owned firms.

We find in column 1 that the coefficient of the post Satyam fiasco dummy 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, Netter, and Yang (2008) 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 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. 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 indistinguishable from zero.

In column 2, we also include firm fixed effects to control for unobserved firm-level heterogeneity. Firm fixed effects will capture the effect of firm characteristics that do not change substantially over time. 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 prediction. This is precisely what we find with the coefficient of post Satyam fiasco dummy in column 2.

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

[11] For example, see M. Bertrand, P. Mehta and S. Mullainathan, *Ferreting Out Tunneling: An Application to Indian Business Groups*, The Quarterly Journal of Economics, 2002, 117 (1), pages 121-148.

4.1.3.1 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 failures happened? In the context of this alternative interpretation, it needs to be noted 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, this is a legitimate concern that we examine. 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 Panel A of Table 6; and (ii) the difference in percentage of IDs in 2008 vis-à-vis that in 2007 to capture the effect of the onset of the financial crisis in column 4 of Panel A 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 post Satyam fiasco dummy is negative and statistically significant. This reassures us that the decrease in the percentage of IDs in Indian corporate boards was more plausibly due to the increase in risk perceptions of IDs post Satyam fiasco and not due to the increase stemming from the onset of the financial crisis.

4.1.3.2 Economic magnitudes

As argued above, the coefficient of the post Satyam fiasco dummy in column 3 measures the pure effect of the Satyam fiasco on the percentage of IDs in Indian corporate boards. We therefore use the coefficient in column 3 to estimate the economic magnitude of the effect. 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 on the boards, on the one hand, and possible appointment of new IDs, on the other hand. Therefore, the decrease is economically significant.

4.1.3.3 Difference-in-difference tests exploiting cross-sectional variation in risk perceptions

The Satyam fiasco increased the risk perceptions of IDs in general. As a result, it is possible that existing IDs may have exited more from poorly performing firms for fear that some futures negative event could blow up on their face and irreparably harm their reputation or lead to civil/criminal charges. Similarly, new IDs may have been less willing to take up positions in such firms. Therefore, the decrease in board independence may have been disproportionately greater in

firms that are performing poorly a priori. At the same time, it is also possible that IDs may have exited more from those firms where they believed that the possibility of accounting manipulation is high. Along similar lines, new IDs may have been more reluctant to join such firms. As a result, the decrease in board independence may have been disproportionately greater in firms where the possibility of accounting manipulation was high *a priori*. We investigate these possibilities in Panel B of Table 6 using the following regression specification:

$$\%\ Board\ independence\ (i,t) = \beta_i + \beta_t + \beta_1 * Post\ Satyam\ fiasco\ dummy(t) * High\ performance(i,t\text{-}1) + \\ + \beta_2 * High\ performance(i,t\text{-}1) + \beta * X(i,t) + \varepsilon(i,t) \qquad (2)$$

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.

In columns 1 to 3 of panel B of table 6, 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 independence decreased disproportionately more in the low performance firms.

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 statistically insignificant, which suggests that neither ID exits nor new ID appointments were seemingly driven by the fear of accounting manipulation. Instead, downside risks due to poor firm performance led to greater decrease in board independence.

4.2 Incorporating the Demand-side view

In order to understand the full impact of a major corporate governance failure on the market for IDs, we need to consider its implications for both sides of the market – the demand for such services by companies in addition to the supply of such services by individuals. On the demand side, as well, the crisis may have well raised questions about the efficacy of IDs as a monitoring institution and led to reduced demand for such services.

Theoretical work highlights two major functions of IDs: monitoring and advising (see Weisbach (1998), Adams and Ferreira (2007), Raheja (2005), and Harris and Raviv (2006)).[12] However, IDs

[12] The monitoring function requires IDs to scrutinize management to guard against harmful behavior, ranging from shirking to fraud. Raheja (2005) argues that compared to insiders, outsiders provide more independent monitoring, but are less informed about the firm's constraints and opportunities. The board's advising function involves helping management make good decisions about firm strategy. Dalton, Daily, Johnson, and Ellstrand

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 Haldia, 2009 for instance).

4.2.1 Reduced demand for IDs post-Satyam

The Satyam fiasco considerably heightened skepticism about (i) the purported "independence" of IDs; and (ii) the efficacy of IDs in monitoring the hard-to-detect actions of 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 US 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. Second, since IDs have to rely on audited financial statements and the auditor itself had colluded with the promoter, this instance highlighted IDs inabilities in monitoring the hard-to-detect actions of self-serving insiders. The incident cast doubt not just on purported "independence" of the Satyam board, but on the efficacy of monitoring provided by IDs, which would lead to reduced demand for IDs (beyond that necessary for compliance with Clause 49). The effect of a decrease in demand for IDs on the percentage of IDs on Indian corporate boards would reinforce the effects of a shrink in supply. Since both shifts would lead to a new equilibrium with lower board independence, it would be difficult to say which blade of the scissor lead to decreased board independence post the Satyam fiasco.

However, the effects of the supply and demand shifts would manifest in opposite directions for the other indicators. The price of directorial services – total director remuneration – would enable us to identify the dominant effect. Given that compliance with respect to percentage of IDs on boards would be a binding constraint in many cases, the demand for ID services would be relatively more inelastic when compared to the elasticity of the supply of ID services. Therefore, we expect the effect of a decrease in supply to dominate that of the decrease in demand. A similar argument also applies with respect to the quality of IDs: While companies may be reluctant to go down the quality ladder,

(1999) argue that "outside directors provide a quality of advice to the CEO otherwise unavailable from corporate staff." Weisbach (1988) notes that "the CEO may choose an outside director who will give good advice and counsel, and bring valuable experience and expertise to the board." Agarwal and Knoeber (2001) show that the proportion of outsiders having political expertise is related to a firm's need for political advice. Fich (2005) concludes that CEOs from other firms are sought as directors because of their ability to provide expert advice.

compliance with Clause 49 may force them to do so and here too the dominant effect is likely to be that due to the shrinking supply.

We therefore now examine the effects on independent director quality as well as director compensation to ascertain the net effect of the supply-side and demand-side influences.

4.2.2 Independent director quality

IDs are far from uniform in quality. Since better quality IDs may have faced greater costs from potential reputational damages post the Satyam fiasco, it is likely that the supply-side shock would increase the "reserve price" for providing such services disproportionately more for the higher quality directors. As a result, it is possible that several high quality individuals may simply refuse such positions after the Satyam episode. Given the fact that companies are *required* to have a certain proportion of IDs on the board to fulfill the clause 49 requirements, we expect that the average quality of IDs on the board would diminish.

In Table 7, we examine the effect of the Satyam fiasco on the quality of IDs measured as percentage of IDs who are lawyers, business professionals, financial experts, retired executives, consultants, academicians, civil servants or government officials. The specifications that we employ and the set of control variables that we include are identical to that in Table 6. The coefficient of Post Satyam fiasco dummy is once again negative. Furthermore by comparing columns 3 and 4, we notice that the decrease in the quality of 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 quality of IDs fell both in 2009 and 2010. Consistent with this pattern, we find that the coefficient of the post Satyam fiasco dummy 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 quality of IDs was not only felt immediately in the year 2009 but continued to be felt in the year 2010. Among the control variables, we find that ID quality is positively correlated with the size of the firm, with firms that are less financially constrained and with firms where promoters have a greater holding.

To estimate the economic magnitude of the effect, we use the coefficient of post Satyam fiasco dummy in column 2 since this coefficient is lower than that in column 1. We find that post the Satyam fiasco the percentage of high quality IDs fell by 0.689%. Compared to the average percentage of high quality IDs (76.1% from table 3), this represents a 9% decrease. We therefore conclude that consistent with the supply side effect dominating any demand-side influences, the quality of IDs declined post the Satyam fiasco.

4.2.3 Director Remuneration

In Table 8, we examine the effect of the Satyam fiasco on ID remuneration. To mitigate the effect of the outliers in director remuneration, we use the logarithm of the remuneration per director as the dependent variable. The specifications that we employ and the set of control variables that we

include are identical to that in Table 6. The coefficient of Post Satyam fiasco dummy 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.

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 (Jensen and Murphy 1990; Hermalin and Weisbach 1998). The contracting theory predicts a positive relationship between pay and firm performance, job complexity, and the absence of cash constraints.

The economic effect of the Satyam fiasco on total director remuneration can be estimated using the coefficient of the post Satyam fiasco dummy in column 3 of panel A of table 8. Since the dependent variable is log of total remuneration per director, post Satyam total remuneration increased by exp(0.545) – 1 = 72%. This increase is similar in magnitude to the effect that Link et al (2008) find for the increase in non-executive director compensation post the Sarbanes-Oxley, which they find equalled 103%, 80% and 56% for the small, medium and large firms.

In column 5, we interact the post Satyam fiasco dummy with the number of ID exits to examine if director compensation increased disproportionately more in firms where IDs existed relatively more. The specification also enables us to control for time trends because we include year fixed effects in this specification. We find that director compensation did increase relatively more in those firms where IDs exited in greater numbers.

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 was due to the increasing perception of risk or because of the increase in workload, 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 post Satyam fiasco dummy is positive and statistically significant. Thus, we conclude that even after controlling for a possible increase in workload the per director compensation increased, which suggests that this increase was more plausibly due to the increase in risks post the Satyam fiasco.

In panel B of table 8, we examine the effect on compensation of IDs. Since information about ID remuneration is only available for us on a subsample 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 Satyam fiasco.

Overall, our results are consistent with the hypothesis that the Satyam fiasco significantly increased ID pay. Fama and Jensen (1983) argue that outside IDs use their directorships to signal to the market that they are expert decision makers and monitors. They further state that "the signals are credible when the direct payments to outside directors are small" (p. 315). However, we find that, due to the dramatic increase in directors' risk, director pay has significantly increased post-Satyam.

4.3 Stock price reactions to independent director exits

What was the stock market's reaction to ID exits following immediately following the Satyam fiasco? Since ID exits were extraordinarily large in Jan 2009, as seen in Figure 1, we restrict our attention to these exits; exits after Jan 2009 may have been influenced by other confounding factors. We compute abnormal returns (AR) using the market model:

$$\tilde{r}_i = \alpha_i + \beta_i \tilde{r}_m + \varepsilon_i \tag{5}$$

where $\tilde{r}_i$ and $\tilde{r}_m$ denote the daily stock returns on stock i and the market respectively while α_i and β_i are firm's alpha and beta respectively with respect to the market return. We use the broad-based BSE Sensex as the proxy for the benchmark market return. We estimate the market model using the daily stock return data for the year 2008 and use the parameter estimates for α_i and β_i to estimate the abnormal returns for Jan '09. The abnormal return for day t for firm i is given by

$$AR_{it} = \tilde{r}_{it} - \hat{\alpha}_i + \hat{\beta}_i \tilde{r}_{mt} \tag{6}$$

The Cumulative Abnormal Return (CAR) over the event window (-1,+2), where date 0 denotes event date, equals:

$$CAR_i(-1,2) = \sum_{k=-1}^{2} AR_{kt} \tag{7}$$

where k denotes the event day, $k \in [-1,2]$. The event date corresponds to the date which the company records as the date of resignation in its filings with the Bombay Stock Exchange (BSE).

4.3.1 Univariate tests

Panel A in Table 9 presents the time series of abnormal returns for the eleven trading days surrounding the date of the ID resignation. Columns (1) and (2) report the event day and the number of observations respectively. In columns (3) and (4), we report the mean stock price reaction as well as the t-statistic for the mean being statistically different from zero, where the t-statistics are computed using robust standard errors that account for clustering in the errors by firm. This is necessary since we have instances of multiple exits from the same firm. Columns (5) and (6) list the number of positive and negative stock price reactions. Column (7) reports the median stock price reaction while column (8) reports the z-statistic corresponding to the sign rank test for the stock price reaction being different from zero.

Panel A indicates that, on average, a negative share price adjustment is associated with an ID resignation following the Satyam fiasco. In particular, the stock price reaction on the days surrounding the resignation is negative for four straight days from day -4 to +1; while the stock price reactions on the other days are not statistically significant, the stock price reaction on day +1 is statistically significant at the 10% level. Using a sign-rank test, we find a statistically significant negative effect at the 10% level for the stock price reaction on day +1. Furthermore, on days 0 and +1, the majority of the stock price reactions are negative. Since in many instances, the firm announces the resignation the day after the one recorded in the BSE-filing (with the average delay being 0.6 days), this pattern is consistent with the effect of the ID resignations being fully incorporated into market prices only when the event becomes publicly known to the market.

In Panel B we report event study results for valuation effects of ID resignations. Average CAR are calculated for the two-, three-, and four-day event windows from day -1 to 0, -1 to +1, and -1 to +2, respectively (day 0 is the date of resignation). We choose these windows to account for (i) any possible anticipation in the subsequent director resignations following the first resignation after the Satyam fiasco; and (ii) the lag between the resignation date recorded in the BSE filings and the date on which the market participants come to know about the resignation. The columns here are identical to those in Panel A. Panel B shows that the CAR for the three-day (-1, +1) and four-day (-1, +2) windows are -1.39% and -1.37% and both these numbers are significantly different from zero. The CAR over the two-day window (-1, 0) is considerably lower -0.78% and is not statistically significant. This is again consistent with the fact that the effect of the ID resignation is fully incorporated into stock prices only when the market participants come to know about the resignation. Using a sign-rank test, we find a significantly negative effect at the 5% or 1% levels for each of the three event windows.

Overall, the results in Table 9 show that stock prices drop significantly following the ID resignations that followed the Satyam fiasco. Thus, the market interpreted ID exits following the fiasco as a negative signal about the firm.

4.3.2 Effect of audit committee presence and business expertise

IDs that serve on the powerful audit committee of the firm have a greater role as monitors and therefore should possess more reliable/ valuable firm-specific information. Also IDs that possess business/ accounting expertise (as proxied by their MBA, CFA or CA degrees) are arguably better positioned in acquiring firm-specific information. Therefore, exits by such IDs who serve on the audit committee and possess business/ accounting degrees could be interpreted by the market as a stronger negative signal about the firm.

We investigate these hypotheses in Table 10. In each of our regressions, we report t-statistics based on standard errors that are clustered by firm. In column (1), we regress CAR on a dummy for the ID being on the board's audit committee and find it to be negative and statistically significant. In

column (2), we regress CAR on a dummy for the ID having business/ accounting expertise and find the effect of the same to be negative and significant as well. Then, to examine if directors possessing both features account for both the above results, we add the interaction of both these dummies together with the dummies themselves in column (3) and find that the entire effect of both the individual variables is soaked up by the interaction variable. In column (4), we include the dummy for the ID being on the board's finance committee and do not find it to matter. Together, the results in Table 10 suggest that the market did interpret exits by such IDs who serve on the audit committee and possess business/ accounting degrees as a stronger negative signal about the firm.

4.3.3 Robustness of negative stock price reaction to independent director exits

We now examine its robustness using multi-variate regressions of the cumulative abnormal returns over the period (-1,+2). Table 11 reports these results. We start by examining the intercept in column (1), which captures the average stock price reaction to the director resignations. In column (2), we employ industry fixed-effects to address the possibility that industry factors (such as the technology sector undergoing a reputation loss in the wake of the Satyam fiasco) are driving our results. Apart from the industry fixed effect, we also include firm-level controls for market capitalization (as a proxy for size), valuation as reflected in the book to market ratio, trading volume, stock performance in the immediate past (returns in December 2008) as well as the interaction effect between the last two to capture any buying or selling pressure in the month before the resignations. We maintain this set of firm-level control variables in all our specifications in Table 11. In column (3), we replace the industry fixed effect with the industry's value weighted return on the date of the director's resignation and find it to be positively correlated. In both specifications, the intercept is significantly negative, which indicates that industry specific factors do not account for our results.

Next, we include board and director characteristics in columns (3) to (6). Among the board related variables, we include board size and board independence to allow for the possibility that perceived value destruction due to either reduced board size or reduced board independence account for the negative stock price reactions. Carter and Lorsch (2003) argue that board independence is driven by tenure of directors on the board. This suggests that the negative stock price reaction was more plausibly a negative signal interpreted by the market over and above the possible value destruction due to the exits *per se*.

Since boards with older directors may have greater tenure on average, we control for the median age and tenure of all directors on the board as well as those of the IDs on the board. We also control for the resigning ID's tenure on the board as well as her age. Except for board size, which is significant and positively correlated with the CAR, all other controls are insignificant. Crucially, however, we find the intercept to be negative and statistically significant across columns (3) to (6).

4.4 Demand For Monitoring Through Other Sources

Given that the Satyam crisis may actually have had effects on the demand and supply of IDs and that we expect the supply effect to dominate (even if primarily for compliance reasons), how can we actually observe the effect on the demand side? We hypothesize that the demand-side effects due to the increased doubt about the efficacy of ID monitoring could lead to enhanced demand for monitoring through other channels. We study three channels for enhanced monitoring: (i) increased focus on internal governance; (ii) larger boards; and (iii) increased attendance in board meetings.

4.4.1 Increased focus on internal governance

Acharya *et al* (forthcoming) argue that managers reporting to the CEO care substantially about the firm's future and are therefore important stakeholders inside the firm. Because of their power to withdraw their (human capital) contributions to the firm, these stakeholders can force the CEO to act in a more public-spirited and far-sighted way, even if the CEO acts in his or her own short-term self interest and shareholders are dispersed and powerless. They label this process "internal governance", whereby agency problems are mitigated in a firm because the potential reaction of subordinates helps to limit the self-serving actions of top management. Therefore, we hypothesize that firms not involved in the scandal may hire new executive directors over and above those required to adjust for the departing IDs for the following reasons.

First, as argued before, it is unlikely that the perception of risks faced by inside directors changed significantly post the Satyam fiasco. Furthermore, the supply of executive directors could be expected to be perfectly elastic within a firm since the firm can draw on its existing employees to recruit them as executive directors. Thus, the supply of inside directors was unlikely to have been affected by the Satyam fiasco. As a result, the increase demand for monitoring through a focus on internal governance could manifest as an increased demand within firms for insider (executive) directors.

Note that firms can meet their independence requirements by either appointing new IDs, albeit of possibly lower quality, or by removing existing inside directors. Therefore, it is likely that overall the departure of IDs would exert a downward pressure on the hiring of executive directors. If, however, we observe that executive directors have been hired in significant numbers when good IDs have become scarce, we can view this as reasonable evidence of the demand for monitoring through more insider voices on the board. Furthermore, such substitution may also manifest in an increase in the quality of executive directors on the board.

Finally, if such a shift towards internal governance is present, it would be consistent with a decrease in Chairman-CEO duality. In cases where the duality persists, internal governance would prod an even greater board presence of executives, to counter-balance the power of the Chairman and CEO. In firms where the Chairman is also the CEO, clause 49 requires that boards in such firms comprise at least 50% IDs. Thus, the downward pressure on the hiring of executive directors would be disproportionately more in such firms. As a result, if we find that executive director appointments

have increased particularly more in firms where the CEO is also the Chairman, such a result would further support firms shifting towards internal governance following the Satyam fiasco.

Table 12 shows the results of this investigation. In column 1, we examine the effect on the percentage of executive directors with the usual set of control variables and with firm fixed effects. We notice that the coefficient of the post Satyam fiasco dummy is positive and statistically significant. The increase in the percentage of executive directors on the board could have happened due to either of two reasons: first, in line with our claim that firms exhibited a preference towards internal governance post Satyam, appointment of executive directors increased. Second, contrary to our claim, it is possible that no new executive directors were appointed to the boards; instead, the exit of IDs from the boards mechanically lead to an increase in the percentage of executive directors in firms where the percentage of independence was already above the threshold. We now examine which of these two phenomena actually transpired using the number of executive director appointments to the boards as the dependent variable. Columns 2 and 3 show the results of examining the effect of the Satyam fiasco on the number of executive director appointments. We notice in column 2 that the appointment of executive directors increased significantly post the Satyam fiasco.

Since the shift towards internal governance would be felt more in those firms where the CEO exerts considerable power when compared to those firms where the CEO does not exert much power, we exploit the cross-sectional differences in CEO power to provide further evidence of this shift towards internal governance post Satyam. For this purpose, we interact the post Satyam fiasco dummy with the dummy that captures whether the chairman of the board is also the CEO or not. We also include year fixed effects in this specification; the post Satyam fiasco dummy is thus not identified in this specification. Column 3 presents the results of this examination. We find that the coefficient of the interaction of the post Satyam fiasco dummy with the dummy for executive chairman is positive and statistically significant. This disproportionate increase in firms where the chairman is an executive is particularly striking because the independence requirements in such firms are greater than that in firms where the chairman is not an executive (clause 49 requires firms that have an executive chairman to have 50% IDs while firms that do not have one need to have only 33% IDs).

In Column 4, we find that the quality of executive directors measured as percentage of executive directors who are lawyers, business professionals, financial experts or persons with Ph.D. degrees increased post the Satyam fiasco. In column 5, we find that post the Satyam fiasco firms are less likely to have executive chairmen on the board. In column 6, we find that the proportion of promoter directors on the board has decreased.

In sum, these pieces of evidence suggest that since the demand for monitoring by IDs may have decreased, firms chose to substitute for the same by focusing more on internal governance *a la* Acharya *et al* (forthcoming).

4.4.2 Board size

Next, we turn our attention to board size (column 7 of Table 12) where too, the Satyam effect is pronounced. As seen in the univariate results, boards have become slightly larger. 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.

4.4.3 Director workload

Following the increase in risks post the Satyam fiasco, we expect an increase in director workload. We find in Column 8 of Table 12 that the percentage of board meetings attended by the directors has increased.

In sum, we find that lower demand for monitoring by IDs possibly led to enhanced demand for monitoring through other channels such as: (i) increased focus on internal governance; (ii) larger boards; and (iii) increased attendance in board meetings.

4.5 Effect of ID exits on Ex-post Performance

In table 13, we examine the effect of ID exits on ex-post firm performance by comparing the before-after difference in performance of firms from which IDs exited vis-à-vis the before after difference in firms from which IDs did not exit. We use ROA, sales growth, profit margin and Tobin's Q as the proxies for firm performance. The regression specifications in table 13 include firm and year fixed effects which ensures that the coefficient of the interaction of the post Satyam dummy with ID exits in the previous year measures 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 constitutes the control group while the group of firms where there was at least one ID exits constitutes the treatment group of firms.

We find that using either of these four measures of firm performance, firms from which IDs exited performed no worse when compared to firms from which IDs did not exit. In fact, surprisingly, the increase in sales growth percentage was greater in firms from which IDs exited when compared to firms from which IDs did not exit.

This result is consistent with the fact that firms chose to substitute monitoring by IDs through monitoring by other channels as we saw above.

The table below summarizes our findings.

Table 1: Summary of findings

S. No.	Attribute	Finding		Reasoning
		Increase	Decrease	
Net effect of shock to supply and demand for IDs:				
1	a. Independent director exits b. Independent director exits -		√ √	A decrease in supply together with a decrease in demand predicts a decrease in quantity (i.e. % of IDs). Since executive directors do not suffer from as much information asymmetry as IDs, the risks for executive directors did not increase as

	Executive director exits c. % Independent directors	√		much post Satyam as for IDs. Therefore, ID exits are expected to be more than executive director exits post Satyam.
2	Independent director quality		√	A decrease in supply together with a decrease in demand imply that for high quality directors the "reserve price" at which they would be willing to offer their ID services is lower than the new equilibrium price. Therefore, high quality directors exit the market.
3	Total remuneration per director	√		While a decrease in supply of IDs predicts an increase in price, i.e. increase in the remuneration of IDs, a decrease in demand predicts a decrease in price. However, due to compliance requirements, demand for ID services is likely to be more inelastic compared to its supply. Therefore the supply effect would dominate leading to an increase in IDs remuneration. Furthermore, given a perfectly elastic within-firm supply of executive directors, executive director compensation is unlikely to have been affected. In sum, average director remuneration should increase.
Stock market reaction to ID exits:				
5	a. Stock price in firms where IDs exited b. Stock price in firms where IDs sat on the audit committee and possessed business expertise exited - Stock price in firms where other IDs exited		√ √	The stock market interprets ID exits as a negative signal about the firm. In particular, when the ID served on the audit committee of the board and possessed business expertise, the market interpreted such an exit as a stronger negative signal.
Monitoring by IDs being substituted by monitoring through other channels:				
6	Board size	√		Given the loss in faith in monitoring by IDs, increased requirement for monitoring by strengthening insider voices on the board may have led to an increase in board size.
7	Director workload	√		The increased perception of risk should lead to greater effort at monitoring by directors resulting in greater director workload.
8	a. % Executive directors b. % Executive Chairmen c. Executive director appointments d. Executive director appointments in firms where the CEO is the chairman vis-à-vis those in firms where the CEO is not the chairman.	√ √ √	√	A loss in faith in the institution of IDs together with a possible shift towards internal governance increases the demand within firms for executive directors, reduces the likelihood of executive chairman and increases appointments of executive directors.
9	Executive director quality	√		A conscious shift towards internal governance should manifest in an increase in the quality of executive directors on the board to offset the decrease in quality of IDs.
10	Percentage of promoter directors		√	Since promoter directors would be the de facto controlling entities in a board, a conscious shift towards internal governance may manifest in a decrease in the percentage of

				promoter directors.
11	Consistent with monitoring by IDs being substituted by monitoring through other channels, ex-post performance in firms where IDs exited no different from firms from which IDs did not exit.			

5. Conclusion

We study the effects of a major shock to the market for IDs in a large emerging market country to better understand the workings of the market. Looking at the effects of arguably the largest corporate governance scandal in India on the board composition, director quality, remuneration and other board features for a sample of over 2500 of the largest Indian firms we shed light on the workings of the market of IDs.

Our evidence suggests that Satyam fiasco had a substantial impact on board's structure. The degree of these board changes varied with firm characteristics. Firms increased their board size. IDs ceded in large numbers resulting in an overall decrease in the percentage of IDs in corporate boards. The quality of directors decreased overall. Directors are less likely to be highly qualified – lawyers, business professionals, financial experts, retired executives, consultants, academicians, civil servants or government officials. Remuneration per director has increased. Combined with larger boards this means that firms are paying much more for their boards. We find evidence consistent with our notion that directors' workload increased after the fiasco. Board meetings are better attended. Consistent with firms substituting monitoring by IDs through monitoring by other channels, we find that insider voices on the board are greater post the Satyam fiasco. Furthermore, the substitution results in ex-post performance in firms where IDs exited being no different from those from which IDs did not exit.

Our finding suggests that the market for corporate directorships can and does react to a major news event in a manner so as to correct some of its earlier lapses even without the prodding of new regulation. The heterogeneity in quality of directors and potential directors affect their reserve prices and remuneration. Furthermore, the crisis seems to have reduced confidence in the existing model of IDs as monitors and a shift towards having more internal governance along the lines of Acharya et al (forthcoming).

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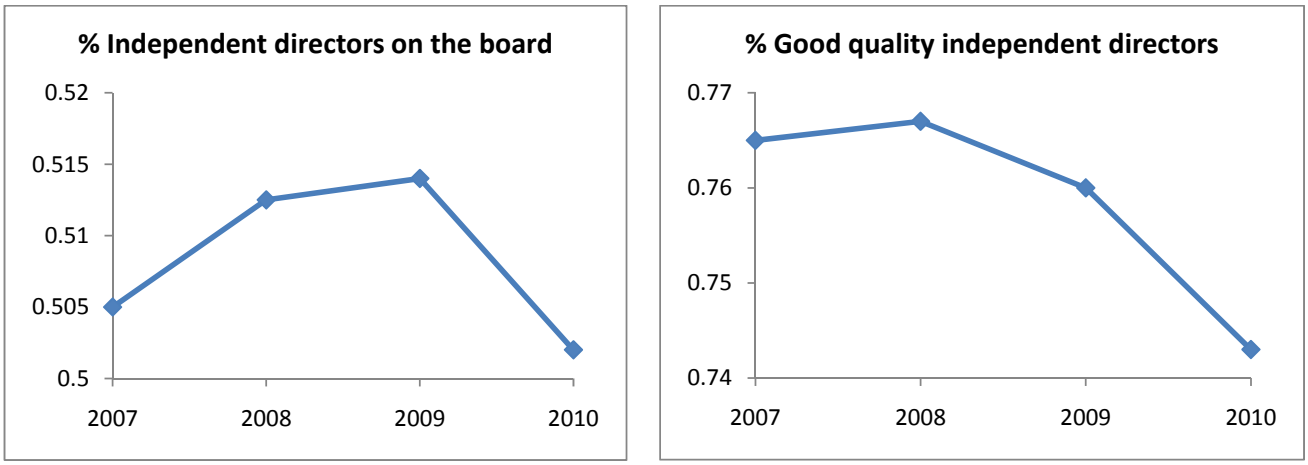

Figure 2: Percentage of Independent Directors and the percentage of good quality Independent Directors on Indian corporate boards from 2007 to 2010

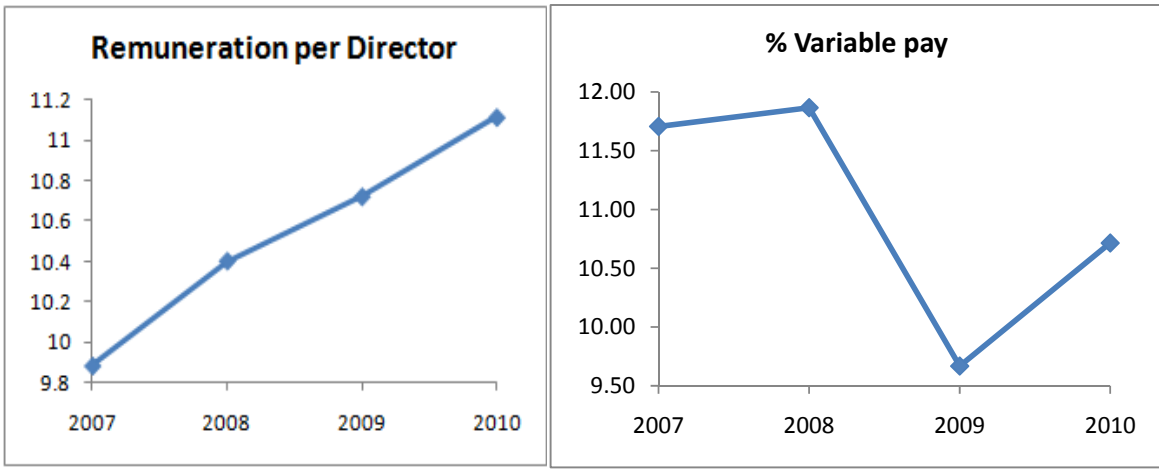

Figure 3: Independent Director remuneration from 2007 to 2010

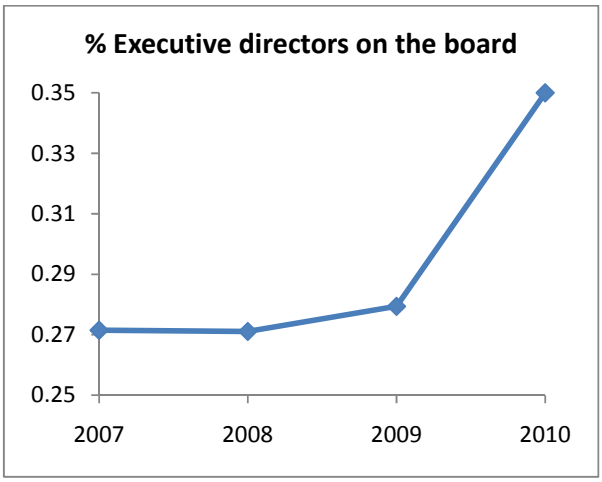

Figure 4: Appointment of executive directors to Indian corporate boards and the percentage of executive directors on Indian corporate boards from 2007 to 2010

Table 2: Variables and Descriptions

The following tables give a brief description of the variables used in the regression analysis and the data source for each variable.

Variable	Description	Source
Independent Director exits	Number of Independent Director exits from the board	Directors Database
Independent - Executive director exits	Number of Independent Director exits exceeding the Executive director exits	Directors Database
Board Size	Number of directors on the board	Prowess
% Independent Directors	Proportion of Independent Directors on the board	Directors Database
% High quality directors	Percentage of directors who are lawyers, professionals, financial experts, consultants etc.	Directors Database
% High quality Independent Directors	Percentage of Independent Directors who are lawyers, professionals, financial experts, consultants etc.	Directors Database
% High quality Executive directors	Percentage of Executive directors 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 held	Number of board meetings held	Prowess
% Meetings attendance	Average meetings attended by the board scaled by the total meetings held	Prowess
Executive director appointments	Number of Executive directors appointed on the board	Directors Database
% Executive directors	Proportion of Executive directors on the board	Directors Database
CEO - Chairman duality	A dummy variable capturing whether the Chairman is also the CEO/MD of the company	Directors Database
% Promoter directors	Proportion of Promoters directors on the board	Directors Database
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
Promoters holding	Percentage shares held by promoters	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.
% Independent Directors	13189	0.33	0.75	50.7	40.5	17.2
Independent Director exits	13265	0	9	0.323	0	0.723
Independent - Executive director exits	13265	-2	9	0.320	0	0.722
% High quality Independent Directors	12725	0	100	76.1	80	26.6
% High quality Executive directors	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
% Executive directors	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. The sample contains 2653 BSE-listed firms over the period 2006-10.

Variable	2006-08	2009-10	% Change
% Independent Directors	50.5	51.1	1.18**
Independent Director exits per year	0.299	0.360	20.4***
Independent - Executive director exits per year	0.298	0.353	18.6***
% High quality Independent Directors	76.5	75.7	-1.04*
% High quality Executive directors	11.06	15.74	42.4***
log(1 + Total Remuneration per Director)	9.7	10.9	12.6***
% Executive directors	27.13	31.47	16.0*
Executive director appointments in a year	0.008	0.026	234.4***
Board Size	7.7	8.2	6.4***
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***

Table 5: Effect of the Satyam fiasco on Independent Director Exits

This table shows the effect of Satyam fiasco on the Independent Director exits from Indian corporate boards. Columns (1), (2) show the effect on the Independent Director exits and columns (3), (4) show the effect on exits by Independent Directors minus those by executive directors. The time period for all the tests in Panel B sample covers the years 2006 - 2010. The PostSatyamFiascoDummy equals one for t ≥ 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:	Independent Director Exits (i,t)		Independent Director Exits (i,t)/ Board Size (i,t)	Independent-Executive director exits (i,t)	
	(1)	(2)	(3)	(4)	(5)
Post Satyam dummy (t)	0.028*	0.041**	0.005**	0.023	0.036**
	(0.014)	(0.017)	(0.002)	(0.014)	(0.017)
Volatility (i,t)	-1.165**	-0.646	-0.056	-1.169**	-0.662
	(0.484)	(0.455)	(0.052)	(0.485)	(0.452)
log(Sales) (i,t)	0.052***	0.006	-0.000	0.052***	0.006
	(0.004)	(0.016)	(0.002)	(0.004)	(0.016)
ROA (i,t)	-0.015	-0.010	-0.001	-0.014	-0.010
	(0.015)	(0.011)	(0.001)	(0.015)	(0.011)
R & D Expenditure/Assets (i,t)	-0.247	-0.538	-0.024	-0.241	-0.543
	(0.191)	(0.632)	(0.050)	(0.191)	(0.636)
Zero dividend dummy (i,t)	0.075***	0.096***	0.009**	0.076***	0.094***
	(0.019)	(0.036)	(0.004)	(0.019)	(0.036)
Promoters holding (%) (i,t)	-0.002***	-0.002	-0.000	-0.002***	-0.001
	(0.001)	(0.002)	(0.000)	(0.001)	(0.002)
Constant	0.210***	0.390***	0.047***	0.209***	0.367***
	(0.042)	(0.108)	(0.013)	(0.042)	(0.106)
Firm FE	No	Yes	Yes	No	Yes
Observations	9,900	9,900	9881	9,900	9,900
R^2	0.129	0.345	0.310	0.128	0.344

Table 6: Effect of the Satyam fiasco on the percentage of Independent Directors on Indian corporate boards

The table shows the effect of Satyam fiasco on the percentage of Independent Directors 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 PostSatyamFiascoDummy 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:	% Independent Directors			
Sample:	2006-10	2006-10	2008-10	2007-08
	(1)	(2)	(3)	(4)
Post Satyam dummy (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	0.013	0.833	0.012	0.019

Panel B

Dependent variable:	% Independent directors(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)				0.131
				(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 7: Effect of the Satyam fiasco on the quality of Independent Directors in Indian corporate boards

The table shows the effect of Satyam fiasco on the percentage of high quality Independent Directors 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 of high quality by searching for his educational qualification as well as his occupation: a director is defined to be of high quality if (s)he is a civil servant, possesses a business or a law degree, is a practicing lawyer, PhD or an academic. The PostSatyamFiascoDummy 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:	% High Quality Independent Directors (i,t)				
	2006-10	2006-10	2008-10	2007-08	2006-10
	(1)	(2)	(3)	(4)	(5)
Post Satyam dummy (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)
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	0.021	0.910	0.023	0.020	0.902

Table 8: 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 independent directors. The PostSatyamFiascoDummy 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)
Post Satyam dummy (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)			
Post Satyam dummy (t) * % High Quality Directors (i,t)						0.093**	
						(0.042)	
% High Quality 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 independent director) (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)
Post Satyam dummy (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 9: Stock Price Reaction to Independent Director Resignations following the Satyam fiasco

This Table shows the stock price reaction to the resignation of independent directors in January 2009, i.e. following the Satyam fiasco. The list of director resignations is drawn from BSE filings as compiled in the Prime Database. We only include independent director resignations between Jan 8th and Jan 31st, 2009 and those by directors that were not on the board of Satyam. Panel A reports the daily abnormal returns (relative to the market model for each trading day from two days before the reported date of resignation to two days after) while Panel B reports the cumulative abnormal returns over different windows surrounding the reported date of resignation. The event date corresponds to the date which the company records as the date of resignation in its filings with the Bombay Stock Exchange (BSE). We estimate the market model using daily stock returns for one year before the resignation. Columns 1 and 2 report the event day and the number of observations respectively. In Columns 3 and 4, we report the mean stock price reaction as well as the t-statistic for the mean being statistically different from zero, where the t-statistics are computed using robust standard errors that account for clustering in the errors by firm. Columns 5 and 6 list the number of positive and negative stock price reactions. Column 7 reports the median stock price reaction while Column 8 reports the z-statistic corresponding to the sign rank test for the stock price reaction being different from zero. ***, ** and * denote statistical significance at 1%, 5% and 10% respectively.

Panel A: Abnormal Returns

Event Day	Obns.	Mean AR	t-statistic	Positive	Negative	Median AR	Sign rank test
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
-2	94	-0.41%	-1.03	45	49	-0.87%	-1.41
-1	94	-0.57%	-1.50	47	47	-0.02%	-1.35
0	94	-0.21%	-0.50	35	59	-0.87%	-1.23
1	94	-0.61%	-1.82*	40	54	-0.53%	-1.79*
2	94	0.03%	0.07	43	51	-0.32%	-0.70

Panel B: Cumulative Abnormal Returns

Event Day	Obns.	Mean CAR	t-statistic	Positive	Negative	Median CAR	Sign rank test
(-1,0)	94	-0.78%	-1.35	36	58	-0.80%	-2.18**
(-1,+1)	94	-1.39%	-2.04**	32	62	-1.98%	-2.89***
(-1,+2)	94	-1.37%	-1.83*	32	62	-1.87%	-2.61***

Table 10: Difference in stock price reaction to independent director resignations after the Satyam Fiasco depending upon the director's role in the board and the director's expertise

This table reports results from the regression of the cumulative abnormal return over days -1 to +2, where day 0 corresponds to the date of director resignation. The list of director resignations is drawn from BSE filings as compiled in the Prime Database. The sample includes independent director resignations between Jan 8th and Jan 31st, 2009. The independent variables are as defined in Table 5. The robust standard errors account for clustering in the errors by firm. ***, ** and * denote statistical significance at 1%, 5% and 10% respectively.

Dependent variable:	Cumulative Abnormal Return (-1,+2) in %			
	(1)	(2)	(3)	(4)
Audit committee	-3.72**		-1.37	
	(-2.39)		(-0.65)	
Director's business expertise		-1.49**	1.89	
		(-2.37)	(0.94)	
Audit committee * Director's business expertise			-5.78*	
			(-1.85)	
Finance committee				-2.01
				(-1.13)
Market Capitalization	0.65	0.43	0.49	0.50
	(1.36)	(1.11)	(1.20)	(1.25)
Trading volume	0.62	-2.77	-1.10	-2.23
	(0.08)	(-0.40)	(-0.16)	(-0.31)
Book to market	0.48	0.54*	0.53*	0.46
	(1.53)	(1.72)	(1.76)	(1.40)
Stock return in Dec08	1.70	2.63	1.21	2.99
	(0.36)	(0.52)	(0.27)	(0.58)
Trading volume * Stock Return in Dec08	5.57	25.45	19.86	20.44
	(0.14)	(0.72)	(0.56)	(0.56)
Constant	-1.26	-2.10*	-1.69	-2.22*
	(-1.13)	(-1.78)	(-1.47)	(-1.77)
Observations	94	94	94	94
R-squared	0.14	0.11	0.19	0.09

Table 11: Robustness of negative stock price reaction to independent director resignations after the Satyam Fiasco

This table reports results from the regression of the cumulative abnormal return over days -1 to +2, where day 0 corresponds to the date of independent director resignation. The list of director resignations is drawn from BSE filings as compiled in the Prime Database. The sample includes independent director resignations between Jan 8th and Jan 31st, 2009. The independent variables are as defined in Table 5. The robust standard errors account for clustering in the errors by firm. ***, ** and * denote statistical significance at 1%, 5% and 10% respectively.

Dependent variable:	Cumulative abnormal return (-1,+2) in %					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-1.37*	-3.32*	-2.77**	-4.86*	-6.20*	-6.44**
	(-1.83)	(-1.79)	(-2.62)	(-1.78)	(-1.89)	(-2.31)
Industry Return			99.09***			
			(2.96)			
Board Size				0.72*		
				(1.67)		
No. of IDs				-0.67		
				(-1.09)		
No. of Promoter directors				-0.55		
				(-1.65)		
Median tenure on board					0.09	
					(0.57)	
Median board age					0.10	
					(0.94)	
Median tenure of IDs on board					-0.08	
					(-0.56)	
Median ID age					-0.04	
					(-0.46)	
Director's tenure						-0.18
						(-1.22)
Director's age						0.08
						(1.53)
Market Capitalization		0.67	0.71	0.56	0.64	0.58
		(0.72)	(1.63)	(1.22)	(1.48)	(1.42)
Trading volume		-3.67	-0.33	-2.47	-2.23	-1.18
		(-0.41)	(-0.05)	(-0.34)	(-0.27)	(-0.16)
Book to market		0.20	0.25	0.36	0.29	0.43
		(0.48)	(0.72)	(1.18)	(0.80)	(1.35)
Stock return in Dec08		4.33	5.91	3.59	3.42	4.18
		(0.68)	(1.21)	(0.72)	(0.68)	(0.98)
Trading volume * Stock Return in Dec08		24.62	9.71	20.76	13.06	11.80
		(0.45)	(0.28)	(0.55)	(0.33)	(0.32)
Industry Fixed Effects	No	Yes	No	No	No	No
Observations	94	94	94	94	94	94
R-squared	0.03	0.30	0.20	0.14	0.09	0.10

Table 12: Effect on the Satyam fiasco on percentage of executive directors, proportion of executive chairmen, appointment of executive directors, board size and attendance in board meeting

This table shows the effect of Satyam fiasco on the percentage of executive directors, the percentage of high quality executive directors, the proportion of executive chairman and the number of appointment of executive directors. We label a director to be of high quality by searching for his educational qualification as well as his occupation: a director is defined to be of high quality if (s)he is a civil servant, possesses a business or a law degree, is a practicing lawyer, PhD or an academic. The PostSatyamFiascoDummy equals one for t ≥ 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:	% Executive directors	Executive Director Appointments		% High Quality Executive directors	% Executive Chairmen	% Promoter Directors	Board Size	% Board Meetings Attended
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post Satyam dummy (t)	0.226***	0.015***		0.671***	-0.006***	-1.324***	0.214***	1.344***
	(0.040)	(0.003)		(0.163)	(0.002)	(0.154)	(0.040)	(0.298)
Executive Chairman* Post Satyam dummy (t)			0.014*					
			(0.008)					
Executive Chairman			0.028					
			(0.027)					
Volatility (i,t)	-0.590	-0.041	-0.000	-2.705	0.085	-1.324***	-3.207***	-26.104
	(1.079)	(0.068)	(0.063)	(4.716)	(0.082)	(0.154)	(1.231)	(20.253)
log(Sales) (i,t)	0.077***	0.005**	0.005**	0.151	-0.001	6.547	0.140***	0.365
	(0.030)	(0.002)	(0.002)	(0.121)	(0.002)	(4.750)	(0.039)	(0.300)
ROA (i,t)	-0.004	-0.001	-0.000	-0.005	-0.000	-0.282**	0.012	0.200
	(0.005)	(0.000)	(0.001)	(0.017)	(0.001)	(0.137)	(0.016)	(1.356)
R&D Expenditure/Assets (i,t)	1.299	0.055	0.064	-6.600	-0.006	-0.191***	0.619	8.748
	(1.515)	(0.102)	(0.107)	(7.929)	(0.022)	(0.072)	(1.194)	(13.858)
Zero dividend dummy (i,t)	0.100	0.008	0.010	0.221	-0.003	-6.421	-0.087	-0.225
	(0.089)	(0.009)	(0.009)	(0.262)	(0.004)	(4.524)	(0.071)	(0.591)
Promoters holding (%) (i,t)	-0.004	0.000	0.000	-0.006	-0.000	-0.136	0.006	-0.006
	(0.007)	(0.000)	(0.000)	(0.015)	(0.000)	(0.289)	(0.004)	(0.028)
Constant	0.446	-0.028	-0.038*	2.122***	0.300***	22.732***	7.460***	65.147***
	(0.398)	(0.020)	(0.022)	(0.790)	(0.014)	(1.102)	(0.265)	(2.190)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	No	No	No	No	No
Observations	9,900	9,900	9,900	9,900	9,900	9,881	9,900	9,456
R^2	0.901	0.284	0.289	0.916	0.984	0.950	0.877	0.637

Table 13: Effect of independent director resignations following Satyam fiasco on ex-post firm performance

This table presents results of difference-in-difference tests for the effect of independent director 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 ≤ 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

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)