

Effect of Personal Liability on Firm Choice by Candidate Independent Directors: Evidence from India

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Abstract

In this paper, we analyse the effect of introducing personal liability for corporate malfeasance on the willingness of potential candidate IDs to accept directorship offers. Following a game theoretic framework, we formulate games between different types of promoters and IDs across alternative information regimes. We analyse if, upon introduction of personal liability, competent ID candidates will migrate to firms with a-priori good governance record. In the Indian context, where the primary objective of an ID is to protect minority interest, we test if IDs who are in high demand choose firms which have low probability of minority interest expropriation and low information asymmetry. We empirically analyze a large sample of ID appointments in India before and after the enactment of Companies Act, 2013. The results suggest that upon introduction of personal liability, competent ID candidates prefer firms with a-priori good governance record. Whereas, while less competent candidates accept any directorship that come their way.

1 Introduction

Instances of governance failures and corporate scandals prompted Indian policymakers to devise mechanisms to enhance the accountability of Independent Directors in India. Prior to the 2013 amendment, Companies Act of 1956 held only the senior management or whole-time directors of a firm to be personally liable and subjected to criminal prosecution¹ in case of fraud. However, the Companies Act of 2013² extends the scope of personal liability and criminal prosecution to IDs as well.

Personal liability can potentially have two effects: it can either (i) make the IDs more diligent in their duties (Jensen, 1993), or (ii) induce them to avoid directorships and exit the ID market (Sahlman, 1990). We utilize game theoretic framework to theorize a third possibility: candidate IDs who are highly sought after in the ID market will choose the firms where the probability of fraud is low, and/or firms where any potential misconduct can be readily detected.

During our extant literature review, we came across empirical evidence on exit of IDs from the ID market on introduction of personal liability measures. Notably, the enactment of Sarbanes–Oxley Act in 2002 (Chen and Moers, 2018) in the United States and the amendment of the Companies Act in 2013 (Naaraayanan and Nielsen, 2021) in India, resulted in resignations by IDs.

However, we did not find studies that specifically analyse how the introduction of personal liability measures influences the choice of firm by candidate IDs who opt to remain in the ID market. This paper aims to fill this gap and further examine whether such preferences differ between competent and less competent IDs.

We develop arguments about potential behavior of candidate IDs using a game theoretic framework. We construct a “Promoter³- ID” game to analyse different types of Promoters, IDs,

¹ From hereon we term this as personal liability

² The Act also introduced the requirement of appointment of Independent Directors, along with the definition of their roles, duties, and liabilities in a parliamentary act. Prior to this Act, the requirements for appointment of independent directors etc., were included in the listing agreement of companies with exchanges.

³ The term Promoter is defined in the Securities and Exchange Board of India (SEBI) Issue of Capital and Disclosure Requirements (ICDR) Regulation 2(1)(oo), and includes persons identified as such, or having control over the firm in capacity as shareholder, director or otherwise, or those in accordance

alternative regulatory and information regimes. Accordingly, we construct 24 games and arrive at the equilibrium solutions. The results suggest that after amendment of Companies Act 2013, candidates who are sought-after in the ID market will prefer a-priori well governed firms (defined as firms that have lower information asymmetry and a lower likelihood of expropriation of minority interest by Promoters). We analyse multiple indicators of likelihood of minority interest expropriation and information asymmetry, and empirically test the equilibrium solutions of the games, using a large sample of ID appointments in India before and after the enactment of Companies Act, 2013. We find the empirical evidence to be in concurrence with the game theoretic findings.

The results indicate an unintended consequence of the policy change: personal liability deters sought-after candidates from taking up directorships in firms with governance problems. Assuming demand in ID market to be an indicator of the skill of an ID, it can be stated that skilled IDs prefer taking up board seats in firms with least governance problems out of fear of personal liability.

The rest of the paper is organized as follows: in the second section, we discuss the corporate governance reforms in India, especially the background, key provisions, and impact of the Companies Act, 2013. In the third section, we provide a brief review of the related literature. In the fourth section, we carry out a game theoretic analysis by constructing and solving multiple versions of the Promoter-ID game. In the fifth section, we discuss findings of empirical analysis based on ID appointments in India. In the sixth section, we conclude and discuss the policy implications.

2 Companies Act 2013: Background, Provisions, and Impact

In India, most firms are closely held, with a small dominant group or family of shareholders possessing substantial shareholding that provides them with majority control rights (Varottil, 2010). In such a scenario, there is an incentive for the dominant shareholders to use their control rights to redistribute wealth at the cost of minority shareholders (Shleifer and Vishny, 1997; Young et al., 2008).

with whose advice/directions/instructions the firm's board is accustomed to act. Promoter group is defined in the Regulation 2(1)(pp) and includes promoter, relatives of promoter, and holding/subsidiary/associate companies of corporate promoter, and other firms where individual promoters have substantial interest.

In India, regulators have adopted the Anglo-American model of oversight, which relies on Independent Directors on the Board to monitor actions that are not in common interest (Varottil, 2010). The primary objective of appointing IDs in India is to: *"to monitor the actions of the companies and their promoter directors from the angle of protection of interests of minority shareholders"* (Standing Committee on Finance, 2010, p23).

A high-profile corporate fraud at Satyam Computers Ltd, dubbed India's Enron (Brown et al., 2014) raised concerns regarding the effectiveness of IDs in safeguarding the rights of minority investors. The parliamentary committee examining the new Companies Bill (Standing Committee on Finance, 2010) noted: *"Many brush aside the Satyam episode as a one-off-case. However, this episode needs to be seen as a watershed event for the institution of Independent Directors. It is a moot point that such a huge scam could be perpetrated, and that too for several years, under the eyes of some of the most reputed and competent persons serving its Board as Independent Directors. It has raised questions that even highly qualified persons may not provide any insurance for corporate governance, as they tend to trust and provide blind support to the promoters."* (p23).

To ensure greater accountability of IDs, Companies Act (2013) introduced personal liability for their failure to effectively utilize information received through the board process to protect minority interest. These measures included criminal prosecution and attachment of personal property of IDs. In contrast, under Companies Act, 1956, personal liability was restricted only to whole time directors or senior executives. Introduction of strict personal liability has led to an increased number of resignations among IDs, as observed in the study by Naaraayanan and Nielsen (2021). There is also anecdotal evidence suggesting that skilled and upright individuals in India may prefer advisory roles rather than serving as IDs to avoid potential liability (Gupta, 2021).

3 Related Literature

The regulatory motivation for introducing personal liability measures was to mitigate the risk of collusion between company promoters and Independent Directors (IDs), thereby preventing IDs from neglecting actions by promoters that could harm minority interests (Standing Committee on Finance, 2010). This apprehension of collusion between promoters and IDs finds resonance not only in

shareholder surveys (LocalCircles, 2020) but also among policy experts in India, as articulated by Haldea (2020).

This view is further supported by previous research. IDs who have social ties with promoters (Fracassi and Tate, 2012; Kim and Lee, 2018), newcomers in the ID market who value early opportunities (Li et al, 2021; Chen et al, 2021), IDs who are concerned about the potential impact of dissent on future appointments (Fogel et al., 2021), or those serving common interlocked⁴ boards (Withers et al., 2012; Bohman, 2012) may exhibit a willingness to accommodate promoter actions, even if such actions run counter to the interests of minority investors.

Moreover, Promoters possess both the capability and incentive diminish corporate transparency (Anderson et al., 2003). The lack of adequate information reduces the effectiveness of scrutiny by IDs ineffective (Cavaco et al., 2016). In the absence of adequate incentive to address this issue, an absence of incentive to do so, IDs may not exert enough effort to gather information and conduct thorough due diligence to over such information gap. This may potentially lead to acquiescence in promoter actions that are detrimental to minority shareholders' interest. Colluding IDs can face disciplinary actions through: (i) Tarnished reputation within the ID market (Ferris et al., 2003; Masulis and Mobbs, 2013), (ii) shareholder activism and legal actions initiated by minority shareholders (Jensen, 1993), or (iii) regulatory liability (Jensen, 1993).

Under the current regulations governing the appointment of Independent Directors (IDs) in India, the impact of ID market reputation can paradoxically work against the interests of minority shareholders. This paradox arises because most firms in India are closely held. As a result, promoters wield significant influence over the appointment of IDs. IDs may, in turn, prioritize cultivating a reputation of being accommodating toward powerful promoters in pursuit of better future opportunities, rather than safeguarding minority interests, as noted by Fogel et al. (2021) and Mace (1986).

⁴ A reciprocal board interlock occurs, where person "X", having ties to firm "A" serves on board of firm "B", and person "Y", having ties to firm "B", serves on the board of "A".

The prospect of effective discipline through litigation initiated by minority shareholders is generally low (Black et al., 2006), and this holds true in the Indian context as well (Varottil, 2012). Consequently, regulatory liability remains the most practical recourse for disciplining IDs who collude with promoters, a strategy chosen by Indian policymakers.

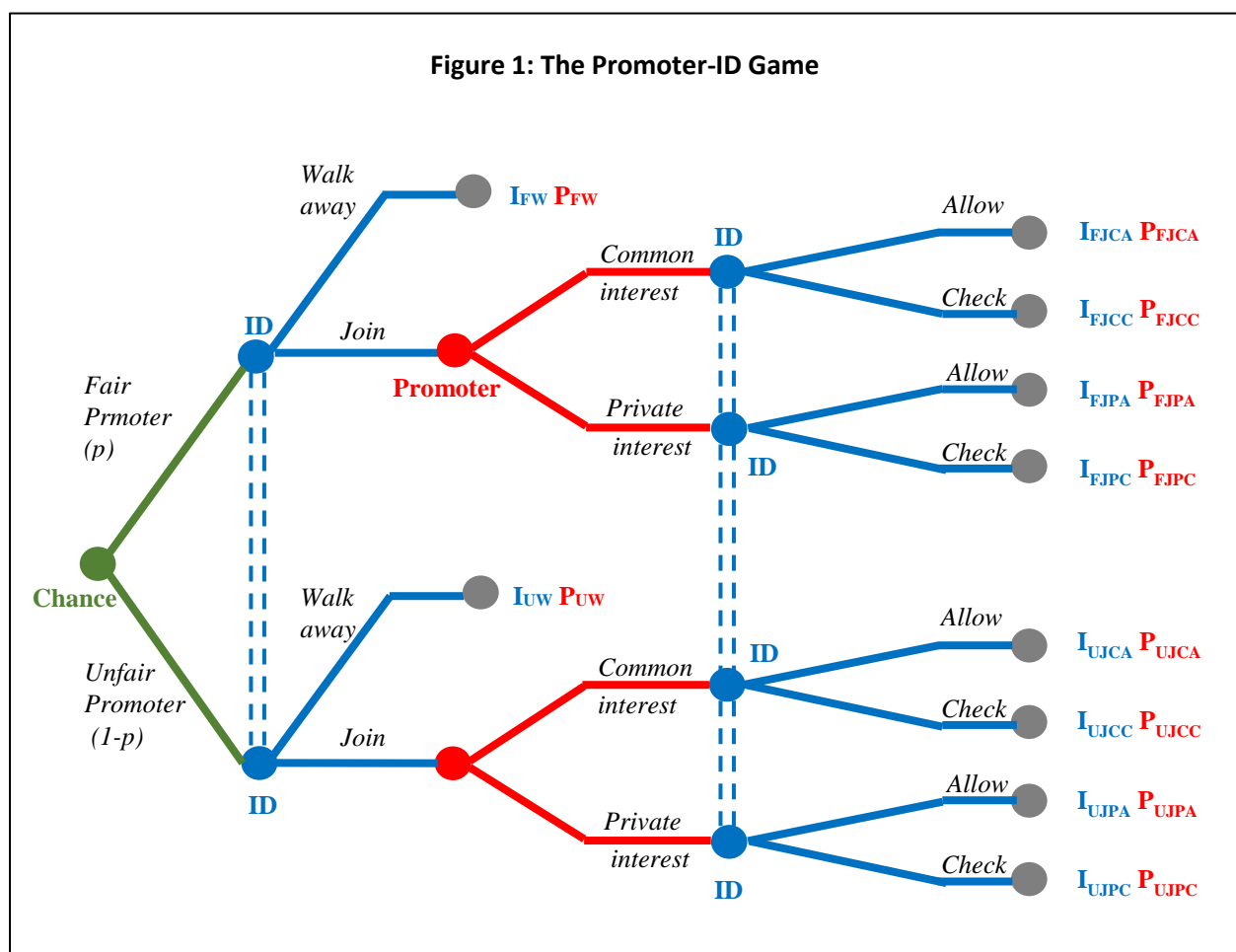
However, personal liability serves as a double-edged sword. While it can act as a deterrent for negligent Independent Directors (IDs), it may also discourage diligent individuals (who lack reciprocal tendencies) from participating in the ID market due to the potential risk of regulatory inquiries, legal proceedings, or sanctions, as highlighted by Sahlman (1990), Chen and Moers (2018), and Naaraayanan and Nielsen (2021). Such risks could potentially be mitigated through increased compensation or the availability of director liability insurance. However, in India, this is not feasible, as ID compensation is capped under the Companies Act of 2013, and director liability insurance does not cover liability arising from fraud and criminal prosecution, as noted by Naaraayanan and Nielsen (2021).

In such a scenario, individuals may opt for one of the two courses of action: (i) exit the ID market altogether, or (ii) only associate with firms that either exhibit a low possibility of corporate misconduct, or join firms where they will have easy access to information which will enable them to easily identify and prevent misconduct. While previous studies, such as those by Chen and Moers (2018) and Naaraayanan and Nielsen (2021), have examined the former i.e. the propensity of IDs to exit following introduction of a personal liability regime, there is a gap in literature when it comes to examining the later.

Our study aims to address this gap and contribute to the existing literature in the following ways: (i) We analyse the impact of a personal liability regime on the selection of firms by candidate IDs, particularly how they use publicly available information about a firm prior to accepting appointment as ID; and (ii) we follow a game theoretic framework to assess the equilibrium solution under different types of IDs, promoters and alternate regulatory regimes. Finally, we empirically evaluate the equilibrium solutions.

4 Game theoretic analysis

We construct a Promoter-ID game involving: (i) an ID making a decision regarding joining a firm; (ii) the Promoter proposing an action which may either be in common interest of all shareholders or in private interest (enriching Promoter at the cost of minority shareholders); and (iii) the ID either allowing or checking the proposal. This game is depicted in extensive form in Figure-1 below. The construction of the game in different settings, including various elements viz. the types of players, information available to them, moves available to the players, and their payoffs; as well as the solution of the game are discussed in subsequent sections.



4.1 Construction of the game

4.1.1 Moves available to the players

The game begins when an ID is approached by the firm to take up directorship. The moves available to the players in the sequential game are as follows:

1. A chance move determines the type of Promoter (*Fair/Unfair*).
2. The ID can either choose to *join* the firm or *walk away*.
3. The game ends if the ID chooses to *walk away*. If the ID decides to *join*, then the Promoter makes a proposal for approval of the board. This proposal may either be in *common interest* or *private interest*.
4. After the Promoter makes the proposal, the ID decides whether to *allow* or *check* the proposal.

4.1.2 Types of players

The Promoter can be of two types: a “*Fair Promoter*” and an “*Unfair Promoter*”. The *Fair Promoter* prioritizes actions that benefit the collective interest of all shareholders as opposed to pursuing actions that primarily serve their personal interest. Conversely, the *Unfair Promoter* prioritizes actions that cater to their personal interest over those that align with the collective interest of all shareholders.

Similarly, the ID can also be of two types: a *high demand* ID and a *low demand* ID. We assume the *high demand* IDs to be persons who are highly sought after by firms. Such individuals can readily find directorship opportunities and if they so wish can find opportunities to fill the maximum permissible directorships. Conversely, low demand IDs are not widely recognized or reputed individuals. They have limited directorship prospects available to them and would seek to build visibility and reputation in the ID market. In summary, in this game, high demand IDs would have a greater propensity to decline directorship opportunities if they are unsure of their prospects.

We assume that both types of IDs are committed to protecting minority interest and do not have reciprocal tendencies. In other words, they will not collude with the Promoter and allow actions that harm minority interest in exchange of being offered the directorship.

4.1.3 Information available to players

We assume that the type of ID (*high demand* or *low demand*) is common knowledge. We solve the game separately for each type of ID. We construct multiple games under distinct information regimes. We begin with an incomplete and imperfect information regime where the ID does not know the type of the promoter (prior belief the Promoter is *Fair* with probability); and based on available information, cannot reliably distinguish whether the promoter action is in *common interest* or *private interest*. After

analyzing the equilibrium solution of this game, we also analyze the impact of the following scenarios on the equilibrium solution: (i) the ID knows the type of promoter but does not have enough information to distinguish whether the course of actions proposed by the promoter is in common interest or private interest (imperfect information regime), (ii) the ID does not know the promoter type, but has enough information to be able to reliably identify the nature of promoter action (incomplete information regime), (iii) if the ID knows the type of the promoter and has adequate information to identify the nature of promoter action (Complete and Perfect Information regime). The game depicted in Figure-1 is under incomplete and imperfect information. In the interest of brevity, we have not presented the game versions under incomplete information, imperfect information, and complete and perfect information regimes⁵.

4.1.4 Payoffs of the players

Player payoffs are denoted as follows: P and I denote the payoff of the Promoter and ID respectively, and the abbreviated subscripts indicate the sequence of chosen moves: $\{F, U\}$: {Fair, Unfair}; $\{W, J\}$: {Walk away, Join}; $\{C, P\}$: {Common interest, Private interest}; $\{A, C\}$: {Allow, Check}. For example, the notation P_{UJPA} denotes the payoff of Promoter when the Promoter type is *unfair*, ID chooses to *join*, Promoter proposal is in *private interest*, and the ID *allows*. The subscript X is used to denote indifference of payoff to some set of moves. For instance, P_{XJXC} denotes payoff of the Promoter when ID moves *join* and *check*, regardless of the type of Promoter and nature of proposal.

In this stylized game, we do not attempt to compute the actual payoffs of the Promoter and ID, and argue the payoffs on an ordinal scale – (i.e., in terms of ranked scores of relative preferences of various outcomes⁶).

⁵ Should you wish to access these versions, the authors will be happy to share them upon request.

⁶ Higher the score higher is the payoff

4.1.4.1 Payoffs of Promoter

Regardless of the type of Promoter as well as the type of the proposal (common or private interest), a Promoter is better off when the ID chooses to *join* and *allow* the proposal than when the ID chooses to walk away, which in turn, is a better outcome than ID choosing to *join* and *check* the proposal. In other words: $P_{XJXA} > P_{XW} > P_{XJXC}$.

We assume that when the ID *checks* a proposal, Promoter only suffers the loss of potential gains if the proposal is *common interest*. But when the proposal is in *private interest*, since the act of the proposal being checked is commonly known, the promoter, in addition, suffers reputational damage and legal costs. Therefore, $P_{XJPC} < P_{XJCC}$.

Finally, since a *fair* promoter prefers gains in *common interest* as against gains in *private interest*, and vice versa for an *unfair* promoter; $P_{FJCA} > P_{FJPA}$; and $P_{UJCA} < P_{UJPA}$.

Based on the above, we establish the set of payoffs of *fair* and *unfair* Promoter type, on an ordinal scale, as follows:

$$\text{Fair Promoter: } \{P_{FW}, P_{FJCA}, P_{FJCC}, P_{FJPA}, P_{FJPC}\} = \{3, 5, 2, 4, 1\}$$

$$\text{Unfair Promoter: } \{P_{UW}, P_{UJCA}, P_{UJCC}, P_{UJPA}, P_{UJPC}\} = \{3, 4, 2, 5, 1\}$$

4.1.4.2 Payoffs of ID

The payoffs of the ID, are contingent not only on the type of ID (*high demand* denoted with a superscript H/*low demand* denoted with a superscript L), but also on the liability regime for IDs. The liability regime can be *strict* i.e., IDs are personally liable and face the threat of criminal prosecution in addition to reputational loss in ID market, or *moderate* i.e., IDs have no threat of criminal prosecution. We denote the type of the regulatory regime – *strict* and *moderate*, with superscript S and M respectively.

As previously outlined, in this game, the ID does not exhibit any reciprocal tendency and would strongly prioritize its role in protecting minority interest. Consequently, they would prefer to allow proposals that are *common interest* and check those that are in *private interest*, regardless of the type of ID or the prevailing liability regime. Therefore, $I_{XJCA}^{XX} > I_{XJCC}^{XX}$, and $I_{XJPA}^{XX} < I_{XJPC}^{XX}$. Since the reputation

of an ID is based on their accommodativeness, IDs will prefer to avoid dissent and therefore prefer to allow proposals in *common interest* over checking those in *private interest*, accordingly, $I_{XJCA}^{XX} > I_{XJPC}^{XX}$. The IDs preference to allow a proposal in private interest depends of the type of regulatory regime. In a moderate liability regime, as a lesser of the two evils, the ID will prefer to *allow* act in *private interest* to *check* an act in *common interest*, thus, $I_{XJPA}^{XM} > I_{XJCC}^{XM}$. However, with under a strict liability regime, the ID will face the threat of criminal prosecution proceedings if they allow proposals in private interest, therefore, $I_{XJPA}^{XS} < I_{XJCC}^{XS}$.

Summarizing the discussions in the preceding paragraph, we establish the following order of preferences for IDs, regardless of their type, in both, the moderate and strict liability regime as:

$$I_{XJCA}^{XM} > I_{XJPC}^{XM} > I_{XJPA}^{XM} > I_{XJCC}^{XM}$$

$$I_{XJCA}^{XS} > I_{XJPC}^{XS} > I_{XJCC}^{XS} > I_{XJPA}^{XS}$$

In our game, both types of IDs are committed to protect minority interest. However, the type of the ID would influence the propensity to walk away. A *high demand* ID is already renowned and would not want to be viewed as a dissenter in the ID market. In other words, since the *high demand* ID has many opportunities for directorships, this type of ID will prefer *walking away* from the firm over *joining* but having to dissent/check⁷. Thus, for the high demand ID, $I_{XJCA}^{HX} > I_{XW}^{HX} > I_{XJPC}^{HX}$. On the other hand, the *low demand* ID does not have enough ID opportunities and is interested in building a career as an ID and establishing reputation and prominence in the ID market. Therefore, a *low demand* ID, will prefer to join the firm and dissent/check rather than walk away from the directorship opportunity. Therefore, $I_{XJCA}^{LX} > I_{XJPC}^{LX} > I_{XW}^{LX}$.

⁷ In the limiting case, the high demand ID will be indifferent between joining and dissenting and walking away. We analyze this limiting case separately. We denote $I_{XXXX}^{H'X}$ as the limiting case, where $I_{XJCA}^{H'X} > I_{XW}^{H'X} = I_{XJPC}^{H'X}$. The payoffs in the limiting case under moderate liability are $\{I_{XW}^{H'M}, I_{XJCA}^{H'M}, I_{XJCC}^{H'M}, I_{XJPA}^{H'M}, I_{XJPC}^{H'M}\} = \{3, 5, 1, 2, 3\}$ and those under strict liability are $\{I_{XW}^{H'S}, I_{XJCA}^{H'S}, I_{XJCC}^{H'S}, I_{XJPA}^{H'S}, I_{XJPC}^{H'S}\} = \{3, 5, 2, 1, 3\}$.

Based on the above, we establish the payoff set for different types of ID under alternative regulatory regimes, as follows:

$$\text{High profile ID, Moderate Liability } \{I_{XW}^{HM}, I_{XJCA}^{HM}, I_{XJCC}^{HM}, I_{XJPA}^{HM}, I_{XJPC}^{HM}\} = \{4, 5, 1, 2, 3\}$$

$$\text{High profile ID, Strict Liability } \{I_{XW}^{HS}, I_{XJCA}^{HS}, I_{XJCC}^{HS}, I_{XJPA}^{HS}, I_{XJPC}^{HS}\} = \{4, 5, 2, 1, 3\}$$

$$\text{Low profile ID, Moderate Liability } \{I_{XW}^{LM}, I_{XJCA}^{LM}, I_{XJCC}^{LM}, I_{XJPA}^{LM}, I_{XJPC}^{LM}\} = \{3, 5, 1, 2, 4\}$$

$$\text{Low profile ID, Strict Liability } \{I_{XW}^{LS}, I_{XJCA}^{LS}, I_{XJCC}^{LS}, I_{XJPA}^{LS}, I_{XJPC}^{LS}\} = \{3, 5, 2, 1, 4\}$$

4.1.5 Possible combinations of games

There are two types of IDs (High demand and low demand), two types of liability regimes (moderate and strict liability), four information regimes (perfect, imperfect, incomplete, incomplete and imperfect). Thus there are total 16 possible games. Further, in the limiting case, when the ID is indifferent between joining and dissenting vs. walking away, for the ID there would be 8 additional games (across 2 liability regimes and four information regimes). In the interest of brevity, this paper only discusses the key findings of the games. The list of all possible 24 games and a summary of equilibrium is provided as Annexure 1. The authors would make available the relevant Gambit v16.0.2 (McKelvey et al., 2014) game files for all the 24 games along with equilibrium solutions on request.

4.2 Equilibrium solutions

4.2.1 Under incomplete and imperfect information

Under incomplete and imperfect information, the ID must decide whether to *join* or *walk away* with prior belief that Promoter is of the *fair* type with probability p . If the ID decides to *join*, then the ID faces a simultaneous move sub-game since the ID cannot distinguish proposals that are in private interest from those in common interest. The summary of solutions of games under incomplete and imperfect information are provided in Table 1 below.

Table 1: Solutions of games under incomplete and imperfect information

ID Type High/ Low demand	Liability Regime	Equilibrium Solution
High	Moderate	(i) ID <i>joins</i> if prior belief of Promoter being <i>fair</i> (p) exceeds $2/3$,

		(ii) A <i>fair</i> promoter acts in <i>common interest</i> , <i>unfair</i> promoter acts in <i>private interest</i> , (iii) ID always <i>allows</i> . And (iv) If $p < 2/3$, the ID strictly walks away.
High	Strict	(i) ID <i>joins</i> if prior belief of Promoter being <i>fair</i> (p) exceeds $3/4$. Note that the threshold probability (prior estimate that the promoter is fair) increases from $2/3$ to $3/4$, (ii) <i>fair</i> promoter acts in <i>common interest</i> , <i>unfair</i> promoter acts in <i>private interest</i> , ID always <i>allows</i> . (iii) If $p < 3/4$, the ID strictly walks away.
Low	Moderate	Regardless of the value of p , walking away from the offer is not a strictly dominant strategy for the ID. In this case, the ID has a mixed strategy between <i>join</i> and <i>walk away</i> , and between <i>allow</i> and <i>check</i> , depending upon the value of prior belief p . If the ID <i>joins</i> , <i>fair</i> Promoter has <i>common interest</i> as strictly dominant strategy. <i>Unfair</i> promoter has <i>common-private</i> interest mixed strategy.
Low	Strict	As in the case of moderate liability, the ID never has <i>walk away</i> as a strictly dominant strategy. Given the lower payoff for walking away, due to the need to establish prominence and reputation in the ID market.

The above threshold values of p are based on the payoff values in our ordinal scale. However, as long as the ranks of different payoffs is the same, the main result will still hold: high demand ID will *join* only if prior belief of Promoter being *fair* exceeds a threshold p , and that the threshold will be higher under a strict regulatory regime.

Conversely, for any given value of p , *walk away* will never will a strictly dominant strategy for a low demand ID. Consequently, the equilibrium solution is a mixed strategy Bayesian Nash equilibrium. The ID has a mixed strategy between *join* and *walk away*, and between *allow* and *check*. If the ID *joins*, pursuit of *common interest* is the strictly dominant strategy for a *fair* Promoter. *Unfair* promoter has *common-private* interest mixed strategy.

4.2.2 Under incomplete information

In this information regime, the ID does not know the type of the promoter. Although, given low information asymmetry, the ID can reliably identify the nature of the Promoter's proposal. In such a scenario, to maximize their payoff, the ID will choose to *allow* proposals in *common interest* and *check* those in *private interest*. As a result, the Promoter, regardless of the type, will always act in *common interest* to maximize their payoff.

Thus, even under incomplete information, regardless of the liability regime; the both types of IDs always choose to *join* the firm, the Promoter acts in *common interest* and the ID *allows*.

4.2.3 Under imperfect information

In this scenario, the ID is aware of the type of Promoter, but cannot reliably differentiate between proposals in *common interest* and *private interest*. Thus, the ID may either decide to *walk away* or enter into a subset of the game which is simultaneous move⁸, in which Promoter can play *common interest* or *private interest* and ID can play *allow* or *check*.

Irrespective of the type of ID or the type of liability regime, the ID will join the firm if the Promoter is of the *fair* type. In the simultaneous game that follows, *common interest* is the strictly dominant strategy for a fair Promoter, and therefore *allow* is the strictly dominant strategy of ID. Therefore, the pure strategy Nash equilibrium is $\{I_{FJCA}^{XX}, P_{FJCA}\} = \{5, 5\}$.

If the promoter type is unfair, the *high demand* type of IDs will choose to *walk away*. In the simultaneous game subset that follows joining a firm with *unfair* Promoter has a mixed strategy Nash equilibrium with Promoter randomizing between *common interest* and *private interest* and the ID randomizing between *allow* and *check*. The *high demand* type of IDs (including the limiting case), find themselves to be better off *walking away* from the opportunity rather than playing the mixed strategy game.

Conversely, a *low demand* ID does not find the payoff of strictly moving *walk away* to be greater than *joining* the firm and playing the mixed strategy game. We find *join-walk away* to be a mixed strategy for the *low demand* ID; who will randomize between the two moves. This conclusion holds for both moderate and strict liability regimes.

4.2.4 Under complete and perfect information

All the games under complete and perfect information, i.e., when the ID knows the type of Promoter as well as nature of Promoter action, have the same sub-game perfect Nash equilibrium.

⁸ Since the ID does not know the nature of promoter's action, it is as if that the ID decides to choose allow or check simultaneously with promoter move.

Regardless of the type of the Promoter, the ID chooses to *join* the firm, the Promoter acts in *common interest* and the ID *allows*.

4.3 Discussion

Drawing insights from the equilibrium solutions to the various iterations of the game, we can make the following observations: (i) a low demand ID, will never opt for a strict walk away strategy. At best they will adopt a mixed strategy involving randomization between *join* and *walk away*. (ii) A high demand ID operating in an incomplete and imperfect information regime, will choose to walk away from firm's directorship if their prior belief of Promoter being *fair* is low. The required threshold to trigger a joining decision will increase under a strict liability regime. This reflects the heightened caution and risk aversion associated with the possibility of personal liability, (iii) If the high demand ID is able to reliably ascertain the type of Promoter, they will always decide to join a firm with *fair* promoter even under an imperfect information regime (iv) Indeed, even if the high demand ID is still unable to identify the type of Promoter, an increase in their prior belief of Promoter being *fair* enhances the likelihood of the ID choosing to join the firm. (v) Regardless of their prior belief, in a perfect information regime, the ID will always join the firm.

5 Empirical analysis

The game theoretic analysis suggests that, in equilibrium, high demand IDs would prefer firms will lower likelihood of minority interest expropriation and lower information asymmetry. This preference is more pronounced in presence of personal liability.

Prior to joining the firm, the candidate ID is likely to have access only to the publicly available information about the firm. Based on this information, they form opinions about the probability of expropriation of minority interest and information asymmetry. Consequently, such information are critical in a candidate ID's decision to join. To empirically evaluate the equilibrium solution to the games, we analyse multiple measures of likelihood of minority interest expropriation and information asymmetry, and assess their impact on joining decisions of candidate IDs.

5.1 Data and methodology

An ID who has joined in a given financial year may have used the latest available information about the firm in arriving at the decision on joining the firm. While the board appointments data is available, data on candidate IDs who were approached but decided to walk away is not available. We are therefore constrained to construct the empirical analysis based on the candidate IDs who have been appointed, i.e., agreed to join the firm. In our empirical analysis, we conduct an OLS regression of the demand for an ID (who chose to join a given firm in a given year), as a function of one period lagged measures of minority interest protection and information asymmetry. We control for other measures to mitigate agency cost and protect minority interest, board characteristics, firm characteristics and industry and year fixed effects. We carry out this estimation separately for the period before and after the enactment of the Companies Act, 2013. We estimate the following regression model:

$$IDDemand_t = \alpha + \sum \beta_i FirmCharacteristic_{t-1} + \sum \gamma_i Controls_{t-1} \quad (1)$$

In equation (1), *IDDemand* is the measure of demand for the candidate ID in the ID market who has joined the firm in the current period, *FirmCharacteristics* are the various measures of degree of prior minority interest protection and information asymmetry in the firm in the prior period, and *Controls* depicts various control variables in the prior period as discussed in the preceding paragraph.

5.1.1 Variable definitions

5.1.1.1 Demand in the ID market

We define *IDDemand* as the number of directorships held by an ID, to indicate how much an individual ID is sought-after for directorship. Prior literature is ambivalent regarding the busyness of an ID and the effectiveness with which they protect minority interest. One strand of literature reasons that busy IDs are reputed for their skill and therefore more effective (Fama, 1980; Fama and Jensen, 1983). Another strand of literature reasons that busy IDs are unable to devote time to the firm and therefore less effective (Fich and Shivdasani, 2012; Marra, 2021). However, in this paper, we are concerned with the demand for ID's services in the ID market and not necessarily with their effectiveness on the Board. It may be noted that this number is the minimum number of board membership that are offered to the

ID. It may be possible that an ID voluntarily refused to accept directorships beyond a certain number of positions. This is a limitation in our definition since data on candidate IDs who were approached but decided to walk away is not available.

5.1.1.2 *Extent of minority interest protection*

In this study, we analyze three alternative indicators of minority interest protection. Firms whose boards protect the interests of minority shareholders enjoy higher valuation (La Porta et al., 2002; Young et al., 2008). Specifically, we test if high demand IDs prefer to join firms with higher market-to-book ratio.

Separation of the role of Chairman of the Board and the MD or CEO is another measure of the extent of protection of minority interest (Jensen, 1993). Duality (i.e., Chairman of the Board playing a dual role as MD/CEO) in the board structure provides weak incentive for monitoring by the board; since the board chairman is involved in administrative capacity. Thus, increasing the likelihood of minority interest expropriation. We measure presence of *Duality* as a binary variable and test whether IDs in greater demand avoid firms with duality.

It is well established in prior literature that promoters have greater incentive and power to expropriate minority interest when their shareholding is high (Shleifer and Vishny, 1997; Young et al., 2008). We define *Promoter Holding* as a fraction of total shares held by promoters, and test whether IDs in greater demand avoid firms with higher promoter shareholding.

5.1.1.3 *Information asymmetry*

Information asymmetry can be measured using market-based indicators such as bid-ask spreads and trading volumes (Elbadry et al., 2015). In this study, we adopt two measures of information asymmetry: (i) Impact Cost, and (ii) Total Turnover. National Stock Exchange of India publishes a high frequency liquidity measure called “Impact Cost”, which is an improvement over simple bid-ask spreads and has been widely used in literature on Indian markets (Kahraman and Tookes, 2017; Hiremath and Narayan, 2016; Dalvi et al., 2010). Impact Cost measures the percentage difference between the average execution price of a fixed order size (INR 100,000) upon consuming liquidity from

a limit order book, from the mid-point of the best bid and ask. The Impact Cost is measured on both buy and sell side, with multiple random snapshots throughout the day; and published on the basis of rolling 6 month observations. Lower *Impact Cost* indicates lesser information asymmetry. In this paper, we test whether IDs with higher demand in the market join firms with lower impact cost in the just completed financial year.

We use Turnover (total value of trades in trillion Indian rupees in the previous year) as a second measure of information asymmetry and test whether IDs with higher demand join firms with greater turnover.

5.1.1.4 Control variables

Based on prior literature (Bathala and Rao, 1995; Suman and Singh, 2022), we control for other measures to mitigate of agency costs, viz: (i) Fraction of the firm held by institutional shareholders, *Institutional Holding*, and (ii) the firm leverage, *Leverage*. Following Cavaco et al. (2016), we control for select board characteristics viz: (i) Fraction of independent directors out of the total directors, *Board Independence*, (ii) Number of directors on the board, *Board Size* (iii) *Peer director's demand* measured as average directorships on other boards per board member. We further control for other firm-specific characteristics such as (i) *Firm size* measured as log transform of total asset value, (ii) *Firm age* measured as years since inception, and (iii) Year-on-year *Income growth* (How et al. 2008, Iqbal et al., 2020). Finally, we include (i) industry fixed effects to control for unobserved industry characteristics and (ii) year fixed effects to control for broader economic factors simultaneously affecting all firms (dummy variables).

5.1.2 Data

We analyze board appointments in the firms listed in the National Stock Exchange of India. We consider appointments during the period 2006-2020, from the ProwessIQ database by CMIE. This represents a large sample period both before and after the enactment of Companies Act, 2013. All variables for the empirical model were also extracted from the ProwessIQ database, except for Impact Cost, which was retrieved from the National Stock Exchange of India website. The overall sample includes 8168 ID appointments.

Table 2 below provides the descriptive statistics of the variables.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	1Q	Median	3Q
Demand for newly joined ID	2.78	3.57	0.00	1.00	4.00
Market to book value ratio	1.34	2.05	0.25	0.65	1.64
Duality	0.38	0.49	0.00	0.00	1.00
Promoter Holding	0.53	0.19	0.43	0.55	0.67
Impact cost (liquidity measure)	1.45	1.85	0.15	0.42	2.11
Market Turnover (INR trillions)	0.065	0.17	0.001	0.006	0.036
Institutional Holding	0.16	0.15	0.02	0.12	0.25
Leverage	62.4	351.6	0.567	1.19	2.40
Board Independence	0.50	0.13	0.44	0.50	0.58
Board Size	10.4	3.54	8.0	10.0	12.0
Peer directors demand	3.18	2.38	1.52	2.81	4.33
Firm Size	9.88	1.93	8.52	9.60	10.96
Firm Age	38.05	23.28	22.00	31.00	50.00
Income Growth	0.287	10.90	-0.024	0.093	0.209

5.2 Influence of prior firm information on IDs' joining decisions

Table 3 below provides the results of a cross sectional regression of the demand for an ID who chose to join a given firm in a given period, as a function of degree of minority interest protection and information asymmetry of the firm at the end of the prior period.

Table 3: Regression results

	Pre-2013	Post-2013
<i>Dependent: Demand for newly joined ID</i>		
Intercept	1.3031	0.1426
<i>Predictors</i>		
Market to book value ratio	0.0709	0.1013***
Duality	-0.3619*	-0.4294***
Promoter Holding	0.4119	-0.0227
Impact cost (liquidity measure)	0.0424	-0.0875***
Market Turnover (INR trillion)	0.2300	0.8000***
<i>Control Variables</i>		
Institutional Holding	1.3502	0.2042
Leverage	-0.0000	-0.0002**
Board Independence	-1.1445*	0.4240
Board Size	0.0385	0.0128
Peer directors demand	0.3846***	0.5450***
Firm Size	0.0234	0.0356

Firm Age	-0.0041	-0.0015
Income Growth	0.0041	-0.0419
Industry Dummies	Yes	Yes
Year Dummies	Yes	Yes
<hr/>		
N	2137	6031
Adjusted R ²	0.08948	0.1791

The results indicate that Post 2013, IDs with greater demand seek firms with greater book to market value ratio (i.e., better ex-ante minority interest protection), as well as lower impact cost and higher turnover (i.e., less information asymmetry). Prior to 2013, except for duality, the IDs did not factor the firms other governance track record while making a decision to join. Even duality is also weakly significant. These results are in accordance with the equilibrium solutions of the game theoretic analysis: IDs with greater demand will strongly prefer a firm with better record of minority interest protection and lower information asymmetry after the introduction of personal liability. Further, we find that IDs do not differentiate between firms that are promoter controlled and those that are widely held while making a choice to join the board. We attribute this to the fact that most firms in India have dominant shareholding of the promoters. In our sample, only 5.53% and 3.33% of firms had promoter shareholding of less than 20% and 10% respectively.

Overall, the results indicate that the IDs who are in greater demand (in the ID market) prefer firms with better ex-ante minority interest protection, i.e., lower probability of expropriation of minority interest, and lesser information asymmetry; after the personal liability is introduced through Companies Act 2013. Such IDs appear to be less concerned about prior minority interest protection level and information asymmetry in absence of personal liability.

5.3 Heterogeneous effect of liability on behavior of high and low demand IDs

Table 3 presents the estimated impact of firm level governance measures and the extent of information asymmetry on the market demand for candidate IDs who choose to join such a firm. Table 3 estimates this impact separately for the periods before and after introduction of personal liability. However, the main finding of our game theoretic analysis suggests a change in choice of firms by high demand IDs in contrast with low demand IDs after the introduction of personal liability. Equation (1) cannot test this finding because it is estimated separately for the periods before and after introduction

of personal liability. Further, this specification could not test the counterfactual: that is prior to introduction of personal liability, the difference in the preferences displayed by high or low demand IDs is constant.

To analyse the heterogeneity in impact of personal liability on the choice of firm amongst two ID-subgroups (high demand and low demand), we follow a subgroup difference-in-differences (SDiD) approach (Shahn, 2023). Accordingly, we specify the following relationship

$$\begin{aligned}
 FirmCharacteristic_{t-1} & \\
 &= \alpha + \beta_1 Liability_t + \beta_2 HighDemand_t + \beta_3 (Liability_t \times HighDemand_t) \\
 &+ \sum \gamma_i Controls_{t-1} \tag{2}
 \end{aligned}$$

This is a modification to the difference-in-differences estimate in the absence of a natural control group. In this study, since the law on personal liability is applicable to all IDs irrespective of whether they are low demand or high demand IDs, we do not have a natural control group for our study. However, the reform is less likely to affect all IDs similarly. Based on our game theoretic analysis, we expect that the enactment of personal liability is more likely to affect a high demand ID's choice of firm as compared to the low demand ID. We exploit this heterogeneity in impact to construct a treatment and control group. To test this, following Shahn (2023) we extend the simple DiD to test for heterogeneity in sub groups. An outline of the proof that is adapted from Shahn (2023) is provided in Annexure 2.

Equation (2) tests if one period lagged (t-1) firm performance characteristics can be predicted by: (i) the type of ID who joined the firm in the current period (t), (ii) Liability regime⁹ effective in the current period (t), and (iii) the interaction of these two variables after controlling for relevant factors.

Unlike in equation (1), in equation (2) the outcome variable is a *FirmCharacteristic* that is indicative of the degree of protection of minority interest or of the level of information symmetry. We analyse whether post introduction of personal liability, firms with high demand IDs in their board tend

⁹ Liability regime takes a value 0 prior to amendment of Companies Act i.e., 2013 and 1 thereafter.

to show better governance indicators after controlling for firm, industry, and economic factors as earlier. Both *FirmCharacteristics* and *Controls* have the same definition and measurements as section 5.1.1.

To classify the IDs into subgroups, we rank IDs in terms of the director positions they hold at the time of accepting a new offer for each year in the sample. We define high demand IDs as those ranking above 75th percentile in terms of number of directorships held, and low demand IDs as those ranking below 25th percentile in terms of number of directorships held¹⁰. The type of ID (high demand or low demand) is specified as a binary variable *High Demand* with zero indicating a low demand ID and one indicating a high demand ID.

For the SDiD analysis, we analyse the period between FY 2009-2018 with 2013 representing the year of regime change. The number of appointments of high and low demand IDs in each of the years in the sample are provided in Table 4. We consider the period corresponding to the unearthing of the Satyam scam in 2009 till the end of FY2014 as the pre-liability period, at the end of which (i.e., from 1st April 2014 or the beginning of FY 2015, personal liability under Companies Act, 2013 came into force). We consider an equal length of subsequent period as the post-liability period.

Table 4: Description of the sample of ID appointments for SDiD analysis

Financial Year		Period and ID type-wise count of appointments			
		Pre-liability Period		Post-liability Period	
Firm characteristics	ID appointments	Low Demand	High Demand	Low Demand	High Demand
2009	2010	252	210	-	-
2010	2011	237	176	-	-
2011	2012	217	152	-	-
2012	2013	255	170	-	-
2013	2014	252	194	-	-
2014	2015	-	-	304	187
2015	2016	-	-	528	351
2016	2017	-	-	347	204
2017	2018	-	-	296	167
2018	2019	-	-	349	226

Note: FY 2009 means the period 1st April 2008 to 31st March 2009, and so on.

¹⁰ This is done to ensure contrast in the busyness of IDs classified as having high and low demand. The IDs with busyness between 25th to 75th percentiles are not considered in the analysis.

The results of the estimation of equation 2 are reported in Table 5. The heterogeneous impact of CA 2013 on high and low demand IDs is shown in the coefficient of the interaction term β_3 .

Table 5: Heterogeneity in the effect of liability on firm choice by IDs

	Market-Book Ratio	Board Duality	Promoter Holding	Impact Cost	Turnover
(Intercept)	1.715***	-0.001	0.344***	6.953***	1.503***
Main predictors					
<i>Liability</i>	0.6958***	0.0023	0.0501***	-1.774***	0.7017***
<i>HighDemand</i>	0.1426***	-0.0299	0.0211***	-0.1994***	0.1492***
<i>Liability × Highdemand</i>	0.1498*	-0.0807***	-0.031***	0.0419	0.1555*
Control Variables					
Leverage	-0.0004***	-0.00005***	-0.0001***	0.0006***	-0.0004***
Institutional Holding	2.489***	-0.4271***	-0.767***	-1.411***	2.579***
Board Independence	-0.3954***	0.123***	-0.1659***	-0.0936	-0.3434***
Board Size	0.0466***	0.0036	0.0047***	-0.0304***	0.0448***
Peer directors demand	0.0314***	-0.0122***	0.0068***	-0.0243***	0.0288***
Firm Size	-0.1761***	0.0473***	0.0272***	-0.3567***	-0.1778***
Firm Age	-0.0003	0.0005*	-0.0005***	-0.0014	-0.0003
Income Growth	0.0033	-0.0003	0.0008	-0.0046	0.0031
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
N	5074	5074	5074	5074	5074
Adjusted R squared	0.127	0.0559	0.3247	0.4514	0.1268

The results indicate that upon introduction of personal liability, high demand IDs show greater preference (as compared to low demand IDs) for firms with: (i) greater market to book ratios, (ii) not having CEO-chairperson duality in boards, (iii) low promoter shareholding and (iv) greater stock market turnover. The firm choice of high demand IDs does not seem to be affected by Impact Cost, perhaps because it may be easier for candidate IDs to track low frequency liquidity measures like turnover rather than high frequency order book measures. Overall, the results find heterogeneity in the impact of enactment of personal liability on the choice of firm by a high demand ID vis a vis a low demand ID.

As a robustness check we also do a ‘placebo test’ (Roth et al., 2023) in the pre-event period to rule out the effect of any pre-existing trend prior to the event. Existence of such prior trends will result in

violation of the parallel trends assumption while specifying a SDiD model (see annexure 2), thus questioning the validity of our findings. In this robustness test, we consider the period between publication of the report of Standing Committee on Finance (2010), which drafted the Companies bill and advocated liabilities for IDs, until the actual passing of Companies Act 2013 by the parliament as the fake post-treatment period (when *Liability* is defined as one) in the SDiD estimation. We consider a prior period of equal length as the fake pre-treatment period (*Liability* is defined as zero). The details of the appointment considered in the sample are provided in Table 6.

Table 6: Description of the sample of ID appointments for Placebo Test

Financial Year		Period and ID type-wise count of appointments			
Firm characteristics	ID appointments	Fake pre-liability Period		Fake post-liability Period	
		Low Demand	High Demand	Low Demand	High Demand
2007	2008	194	125	-	-
2008	2009	176	125	-	-
2009	2010	252	210	-	-
2010	2011	-	-	237	176
2011	2012	-	-	217	152
2012	2013	-	-	255	170

We re-estimate equation (2) for this different time period. The results of this robustness test are provided in Table 7.

Table 7: Placebo estimation: Constant difference in ID choice prior to liability

	Market-Book Ratio	Board Duality	Promoter Holding	Impact Cost	Turnover
(Intercept)	1.7716***	0.0176	0.3138***	5.9456***	1.7535***
Main predictors					
<i>Liability</i>	-0.4446***	-0.0778*	-0.0050	0.7302***	-0.4711***
<i>HighDemand</i>	-0.0264	-0.0596*	-0.0087	-0.1267	-0.0339
<i>Liability</i> × <i>Highdemand</i>	0.1227	0.0441	0.0174	-0.0590	0.1423
Control Variables					
Leverage	-0.0003**	-0.0001**	-0.0001***	0.0005**	-0.0003**
InstHolding	1.6864***	-0.3059***	-0.8224***	-1.9575***	1.6863***
BoardInd	-0.4873***	0.1053*	-0.1310***	0.1230	-0.4563***
BoardSize	0.0207**	0.0017	0.0034***	-0.0064	0.0178**
BoardBusyness	0.0732***	-0.0106***	0.0065***	-0.0386***	0.0719***
LnAssets	-0.1265***	0.0562***	0.0321***	-0.4161***	-0.1221***

FirmAge	-0.0009	0.0015***	-0.0004***	0.0014	-0.0010
IncomeGrowth	0.0009	-0.0006	0.0001	0.0008	0.0008
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
N	2289	2289	2289	2289	2289
Adjusted R squared	0.169	0.0649	0.3544	0.581	0.1679

Placebo SDiD coefficient β_3 is not statistically significant in determining any outcome variable, thus indicating the absence of any preexisting trend in the preference of firm for high and low demand ID prior to introduction of personal liability.

6 Conclusion

Most firms in India have substantial promoter shareholding, giving rise to concerns about Principal-Principal agency problem of expropriation of minority interest. Indian regulations seek to protect minority interest by monitoring the Promoter actions through IDs. However, there has been a concern that the IDs may collude with the promoters and avoid undertaking reasonable due diligence. The policymakers have sought to address this concern by introducing a stringent personal liability regime for IDs.

Our work shows the unintended consequence of introduction of personal liability on IDs. We find that, given the cap on the number of ID appointments that an individual can accept, their remuneration, and that the fact that ID insurance policies do not compensate for criminal liability, high demand IDs limit their risk by preferring firms with good governance track record.

In effect, enactment of personal liability for IDs has weakened monitoring quality, because the study reveals that expert IDs seek to avoid poorly governed firms, where their presence is most required. Such IDs migrate to well-governed firms, where monitoring concerns are lesser.

Ensuring discipline by IDs through reputational effects in the ID market may be a better strategy for aligning interest of the IDs with minority shareholders. This would also reduce the flight of high demand IDs to firms that are already well governed. One way to achieve this is by the 'majority of the minority' principle – i.e., ID appointment through voting by minority shareholders alone, or requiring

their consent for appointment (Anand, 2018; Winden, 2018). Similarly, Bebchuk and Hamdani (2017) suggest appointing enhanced-independence directors responsible for vetting decisions in certain vital matters involving conflict in the interests of promoters and minority shareholders. As a policy implication of our findings, we suggest judicious use of such regulatory mechanisms to improve minority shareholder protection in India.

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Annexure 1: Possible game versions and solutions

The three types of pay-offs of ID (High demand, limiting case for high demand, and low demand), two types of liability regimes (moderate and strict liability), and four information regimes (perfect, imperfect, incomplete, incomplete and imperfect) make possible total 24 versions of the game. The set of all possible combinations is as follows:

Game version	Information Regime	Liability Regime	ID Type High/Low demand	Equilibrium Solution
Game 1	Perfect	Moderate	High	In all perfect information games, all types of IDs join the firm in all liability regimes. Promoter, regardless of type, propose actions in common interest, and the ID allows the same.
Game 2	Perfect	Moderate	High (Limiting case)	
Game 3	Perfect	Moderate	Low	
Game 4	Perfect	Strict	High	
Game 5	Perfect	Strict	High (Limiting case)	
Game 6	Perfect	Strict	Low	
Game 7	Incomplete	Moderate	High	
Game 8	Incomplete	Moderate	High (Limiting case)	
Game 9	Incomplete	Moderate	Low	
Game 10	Incomplete	Strict	High	
Game 11	Incomplete	Strict	High (Limiting case)	
Game 12	Incomplete	Strict	Low	ID <i>joins</i> firm if Promoter is <i>fair</i> ; Promoter acts in <i>common interest</i> , ID <i>allows</i> . ID <i>walks away</i> if the Promoter is <i>unfair</i>
Game 13	Imperfect	Moderate	High	
Game 14	Imperfect	Moderate	High (Limiting case)	ID always joins firm if Promoter is <i>fair</i> , followed by <i>common interest – allow</i> . If promoter is <i>unfair</i> , the ID follows a mixed strategy, randomizing between <i>join-walk away</i> .
Game 15	Imperfect	Moderate	Low	
Game 16	Imperfect	Strict	High	
Game 17	Imperfect	Strict	High (Limiting case)	See game 14
Game 18	Imperfect	Strict	Low	See Game 15
Game 19	Incomplete & Imperfect	Moderate	High	ID <i>joins</i> if prior belief of Promoter being <i>fair</i> exceeds 2/3, <i>fair</i> promoter acts in <i>common interest</i> , <i>unfair</i> promoter acts in <i>private interest</i> , ID always <i>allows</i> .
Game 20	Incomplete & Imperfect	Moderate	High (Limiting case)	Same as Game 19, threshold for prior belief 1/3.
Game 21	Incomplete & Imperfect	Moderate	Low	ID has a mixed strategy between <i>join</i> and <i>walk away</i> , and between <i>allow</i> and <i>check</i> . If the ID <i>joins</i> , <i>fair</i> Promoter has <i>common interest</i> as strictly dominant strategy. <i>Unfair</i> promoter has <i>common-private</i> interest

				mixed strategy, based on the value of prior belief.
Game 22	Incomplete & Imperfect	Strict	High	Same as Game 20, strict penalty increases threshold for prior belief to 3/4.
Game 23	Incomplete & Imperfect	Strict	High (Limiting case)	Same as Game 19, strict penalty increases threshold for prior belief to 1/2.
Game 24	Incomplete & Imperfect	Strict	Low	Same as Game 21.

Annexure 2: Subgroup difference-in-differences (SDiD) estimation

The proof of subgroup difference-in-differences estimation (SDiD), adapted from Shahn (2023) is placed below.

We observe IID realizations of random variable

$$O = (Demand, SansLiab, WithLiab),$$

Where *Demand* is the demand for ID in the market, which can take values {High, Low} indicating high or low demand for the ID in the ID Market. *SansLiab* and *WithLiab* indicate the firm choice made by an ID in the regulatory regime without and with personal liability respectively.

We consider a two period model where there is no IDs face personal liability in period $t = 0$, and all IDs face personal liability in the period $t = 1$. $WithLiab(0)$ denotes counterfactual untreated outcome value (Rubin, 1974) at $t = 1$, i.e. the choices which the IDs would have made in period 1, had the liability not been introduced, and $WithLiab(1)$ denotes the potential choices made by IDs under liability in the period $t = 1$. We make the standard consistency assumption that $WithLiab(1) = WithLiab$, since all IDs face liability in period $t = 1$.

We are interested in the estimate:

$$E[WithLiab(1) - WithLiab(0)|_{Demand=H}] - E[WithLiab(1) - WithLiab(0)|_{Demand=L}] \quad (1)$$

$WithLiab(0)$ is not observable. However, we make the subgroup parallel trends assumption across different values of *Demand*, i.e.

$$E[WithLiab(0) - SansLiab|_{Demand=H}] = E[WithLiab(0) - SansLiab|_{Demand=L}] \quad (2)$$

We define the subgroup difference-in-differences (SDiD) estimator as:

$$E[WithLiab - SansLiab|_{Demand=H}] - E[WithLiab - SansLiab|_{Demand=L}] \quad (3)$$

It can be shown easily that under the subgroup parallel trends assumption (2); the SDiD expression in (3) is equivalent to the expression (1). We provide this simple proof below:

$$\begin{aligned} & E[WithLiab - SansLiab|_{Demand=H}] - E[WithLiab - SansLiab|_{Demand=L}] \\ &= (E[WithLiab - SansLiab|_{Demand=H}] - E[WithLiab(0) - SansLiab|_{Demand=H}]) \\ &\quad - (E[WithLiab - SansLiab|_{Demand=L}] - E[WithLiab(0) - SansLiab|_{Demand=L}]) \\ &= (E[WithLiab - WithLiab(0)|_{Demand=H}] - E[WithLiab - WithLiab(0)|_{Demand=L}]) \\ &= (E[WithLiab(1) - WithLiab(0)|_{Demand=H}] - E[WithLiab(1) - WithLiab(0)|_{Demand=L}]) \end{aligned}$$

The proof can be explained as follows: given the subgroup parallel trends assumption, the first step of the proof is adding and subtracting the equal terms that cancel out. The second step cancels out *SansLiab*, and the third step replaces *WithLiab* with *WithLiab(1)* by consistency assumption.