

Corporate governance, voluntary disclosure and firm valuation relationship: evidence from top listed Indian firms

Indian firms' valuation relationship

Rupjyoti Saha

School of Commerce, XIM University, Bhubaneswar, India

Received 14 September 2021
Revised 6 February 2022
9 June 2022
8 September 2022
Accepted 23 October 2022

Abstract

Purpose – This study aims to examine the relationship between corporate governance (CG) voluntary disclosure (VD) and firm valuation (FV). Moreover, the study also investigates whether VD mediates the impact of CG on FV or not.

Design/methodology/approach – The study is based on a panel data set of top 100 listed firms on Bombay Stock Exchange (BSE) over the period of 2014–2018 and develops CG index and VD index (VDI) in order to capture both the constructs respectively. The author adopts suitable panel data model to examine the relationship between CG, VD and FV as well as indirect impact of CG on FV through mediation of VD. Further, the author uses instrumental variables regression model for robustness check.

Findings – The author's findings reveal significant positive impact of CG on FV. Likewise, VD also exhibits significant positive impact on FV. Notably, the interaction of CG and VD complements each other in making positive contribution towards FV. In addition, the author observes that VD partially mediates the impact of CG on FV. Specifically, the outcome suggests that CG apart from having direct impact on FV also influences the same through the mediation of VD. Moreover, as the direction of indirect impact coincide with direct impact, such indirect impact has complementary relationship with the direct impact, implying that when CG makes direct contribution towards improving FV, CG's contribution toward FV through mediation of VD also increases.

Originality/value – To the best of the author's knowledge, this is the first endeavor in the extant literature that examines the interaction performance impact of CG and VD. Further, the author also provides primary evidence on the mediating impact of VD in the relationship between CG and FV.

Keywords Corporate governance, Voluntary disclosure, Firm valuation, Interaction, Mediation

Paper type Research paper

1. Introduction

The occurrence of big corporate debacles on the global and national front such as Enron, WorldCom, Satyam, etc. over the past two decades coupled with the Global financial crisis of 2007 is largely attributed to the lack of corporate transparency (OECD, 2009). Subsequently, to regain investors' confidence, market regulators have emphasized the role of corporate governance (CG) and voluntary disclosure (VD) to protect the interest of investors (OECD, 2015). The relevance of both CG and VD are well explained by the popular agency perspective, which is derived from the core characteristic of a modern corporation, i.e. separation of ownership and management that create conflicts of interest, which is widely known as agency problems between managers and owners as the former is considered to have better access to information than later. To resolve such problems, the theory advocates that both CG and VD can act as effective tools (Jensen and Meckling, 1976; Fama and Jensen, 1983). While CG mechanisms control opportunistic behavior of managers by way of performance-based rewards, contracts and other rules, thus reducing the opaqueness of their activities, VD on the other side reduces information asymmetries and lessens the possibility of private benefits to managers (Michelon and Parbonetti, 2012). Besides, reducing agency



cost, VD is also motivated by several benefits for capital market participants like reducing the cost of capital (Botosan, 1997), improve firm performance and stock liquidity (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994) and increasing information intermediation (Healy and Palepu, 2001).

Empirical research on CG is largely based on agency theory that considers CG as a solution to the agency problem and advocates for a sound governance mechanism for alignment of owners' interest with that of managers, which collectively assists in maximizing overall value for firms. However, empirical observations in this regard are mixed, owing to contextual and methodological variations. Likewise, VD has also drawn substantial attention of the researchers owing to its ability to reduce agency problem in the form of information asymmetry coupled with its additional capital market benefits. Though several benefits are associated with greater transparency, VD is not costless as it leads to the emergence of *proprietary cost* (Dye, 1986; Campbell *et al.*, 2001), *information production and dissemination cost* (Hassan and Marston, 2010), *political cost* (Cormier *et al.*, 2005) and *litigation cost* (Darrough and Stoughton, 1990). Thus, managers make a trade-off while disclosing information voluntarily. Extant literature on VD, mostly from developed market, concede the role of VD in creating favorable perception of firms in the eyes of investors, which ultimately contribute toward better market valuation of firms (Botosan, 1997; Francis and Schipper, 1999; Hail, 2002; Uyar and Kılıç, 2012). However, literature in this regard from emerging market is contradictory and inconsistent possibly owing to their unique institutional setting (Banghøj and Plenborg, 2008; Hassan *et al.*, 2009). Nevertheless, there is an increased involvement of governments, regulatory bodies and even some supranational organizations (e.g. European Union, International Finance Corporation, Organisation for Economic Co-operation and Development (OECD), United Nations and World Bank) in recent years in developing recommendations on disclosing information about various aspects, which falls beyond the perimeter of traditional accounting, thereby emphasizing the role of VD in reflecting holistic picture of business so as to reduce the chances of misvaluation of their stock prices.

Considering the pivotal role of VD in predicting FV, it becomes pertinent to know whether VD moderates the relationship between CG and FV. Moreover, as agency perspective considers both CG and VD as effective tools in mitigating agency problems (Patelli and Prencipe, 2007), it raises a question as to whether the two mechanisms are independent, substitutive or complementary in their impact on FV. However, empirical investigation of the interactive impact of CG and VD on FV has largely remained unanswered in the extant literature. Furthermore, prior work on CG is based on the implied assumption of direct relationship between CG and firm performance (FV) and the idea of such relationship being mediated by any variable, which is associated with both CG and FV, remains unrecognized in the existing works. Hence, the channel through which the impact of CG gets reflected on FV is ambiguous.

In this regard, transparency and disclosure have been strongly emphasized in global context as the leading indicators of CG quality and key contributors of FV since they act as a dialog between firms and investors for understanding the company's strategic and operational priorities, which assists investors in making better prediction of firms' future performance (Parum, 2005; OECD, 2015). Further, agency perspective also suggests that CG mechanisms can use VD as a tool to reduce information asymmetry and consequently influence market perception about FV (Barako *et al.*, 2006; Al-Akra and Ali, 2012). Hence, the dominant theoretical framework as well as prevailing CG practices provides a clear backdrop for conceptualization VD as a mediator that explains the impact of CG on FV. However, such relationship remains unexplored in extant literature.

Apart from agency perspective, positive accounting theory and signaling theory extend several economic incentives of VD such as low monitoring cost (Barako *et al.*, 2006), management talent signaling (Campbell *et al.*, 2001) and better information environment, leading to reduce cost of capital (Luo *et al.*, 2006) etc. Thus, VD is an excellent tool for

managers to uphold the interest of all stakeholders by capitalizing its benefits in the form of overall market valuation of firms.

Against this backdrop, the present study raises the following research questions:

- RQ1.* What is the impact of CG on valuation of Indian firms?
- RQ2.* Are VD made by Indian firms value relevant?
- RQ3.* Is there any interactive effect of CG and VD on valuation of Indian firms?
- RQ4.* Does VD mediate the relationship between CG and FV for Indian firms?

It is pertinent to address the aforesaid questions in Indian context due to certain reasons. First, though opening up of the Indian economy in 1991 has attracted considerable investment in terms of foreign institutional investors (FIIs) and foreign direct investment (FDI) (Akhtar, 2013), the nation concurrently experienced a number of corporate scams (Education World, 2018), which induced some noteworthy CG reforms like Companies Act, 2013; Securities and Exchange Board of India (SEBI) Revised Clause 49 and SEBI's Listing Obligation and Disclosure Requirement (LODR) Regulation, 2015 for raising the standard of governance and disclosure practices of Indian firms. Thus, it will be interesting to unveil the standalone impact of such rule-based Indian CG codes in maximizing shareholders' wealth as well as joint impact of CG and VD on FV. Second, Indian economy is characterized by some unique traits of emerging market such as flourishing growth potential, closely-held corporation, fragile investor protection environment, less-liquid stock markets and self-serving motives of managers and substantial owners encourages firms to keep disclosure at lower level (Raithatha and Bapat, 2012). These peculiarities make India a suitable platform to know whether VD made by Indian firms is value relevant or not. Third, majority shares of listed Indian firms are held by family groups, also called as promoters, in local parlance or state or other institutional investors. This leads to the transformation of vertical/type-I agency problem between owners and managers to horizontal/type-II agency problem between majority–minority shareholders (Balasubramanian and Anand, 2013). Thus, it seems pertinent to know how the present rule-based CG framework blends with voluntary approach of disclosure in reducing information asymmetry for minority shareholders in a horizontal agency setting. Moreover, such interaction between CG and VD also raises the inquisitiveness to know whether VD acts as a mediator in the relationship between CG and FV. Finally, though CG standards in India are raised over the past few years to maintain parity with the international benchmark, their implementation at firm level is still lacking (Ganguli and Guha Deb, 2016), which necessitates examining whether prevailing CG practices significantly upholds the core principle of transparency in form of VD in order to enhance FV.

The study makes several contributions to the literature. First, to the best of my knowledge, this is the first endeavor in the extant literature that examines the interaction impact of CG and VD on FV. Second, the present work also provides primary evidence on the mediating impact of VD in the relationship between CG and FV. Third, departing from majority of prior Indian studies that are mostly based on single/few CG variables, thereby providing mixed evidence on the performance impact of CG, this study holistically captures CG in two ways: one based on overall CG variables, while the other focuses on only board related variables and excludes the ownership structure variables and provides evidence of significant positive impact of board level CG on diverse measures of FV. Fourth, this study contributes toward the VD literature in India by developing its index to capture overall VD and investigating its value relevance in the same context. Lastly, by examining the relationship between three board variables, i.e. CG, VD and FV in a single study, this work ratifies the predictions of diverse theoretical perspectives like agency theory, positive accounting theory and signaling theory in context of an emerging market.

2. Theoretical framework and hypotheses formulation

The influence of CG and VD on firm valuation (FV) is largely explained by the agency theory as it considers information gap between owners and managers as one of the key sources of agency problem. It advocates for both sound governance mechanism and more transparent disclosure to convince shareholders that managers are working in their best interest, which ultimately improves firms "valuation" (Barako *et al.*, 2006; Brockman *et al.*, 2010). However, the parties involved in the agency problems, which the control mechanisms try to resolve, vary for firms depending on their type of ownership structure whether diffused or concentrated. In case of diffused ownership as observed in case of developed countries, the control mechanisms as per agency theory like CG or VD seeks to reduce vertical (Type-I) agency problem that entails minimizing managerial opportunism (Roe, 2004). Contrary to it, in concentrated ownership where few shareholders control everything that is widely prevalent in emerging economies, the control mechanisms strives to limit horizontal (Type-II) agency problem (Shleifer and Vishny, 1997) between majority and minority shareholders by preventing of expropriation of later by the former (Sarkar, 2009). The theory propounds that both Type-I and Type-II agency problems have their own effect on complementary/substitutive relationship between CG and VD. For instance, in a type-I agency setting monitoring cost borne by firms are quite high due to diffused ownership structure and firms generally attempts to minimize such costs through better VD (Fama and Jensen, 1983), while in case of Type-II agency setting/concentrated ownership structure controlling owners have better access to information by virtue of their representation on board, and thus, VD are generally not encouraged (Jackling and Johl, 2009). Hence, this study considers Indian context having Type-II agency setting (Singh and Gaur, 2009) to know how firms use both CG and VD in reducing their agency problems associated with information asymmetries, particularly for minority shareholders. Apart from agency perspective, another theory that motivates VD is the positive accounting theory. It explains and predicts how managers choose a particular accounting method based on maximizing individual's self-interest and firms' wealth under three hypotheses, namely bonus plan, debt-covenant and political cost (Gray *et al.*, 1995). It uncovers that managers cautiously chooses accounting methods that are more likely to report (1) increased current income under bonus plan, (2) higher income in order to relax debt constraints under debt covenant and (3) reduced current income to avoid political cost (Omran and El-Galfy, 2014). Considering the capital market benefits of VD, positive accounting theory implies that substantial owners in Indian context would be keen to make VD in order to reap such benefits. In the similar vein, signaling theory posits that managers opt for discretionary disclosure to signal their superiority in market for the purpose of attracting capital and earning reputation (Verrecchia, 1990). Thus, it implies that in a context of a horizontal agency setting like India, managers who are ultimately dominated by the blockholders are likely to make more VD to make them unique among its peers in the eyes of retail investors.

To extend a clear visualization of the relationship of both CG and VD with FV, the theoretical framework is represented with the help of a diagram (Figure 1).

Thus, the theoretical framework provides indication of the relevance of both CG and VD in influencing market valuation of the firms. Hence, it becomes quite imperative to examine the relationship between CG, VD and FV in the form of both standalone impact of CG and VD on FV as well as their interactive and mediating effect of VD in the nexus of CG–FV.

Empirical literature on the aforesaid relationships is discussed below.

2.1 Corporate governance and firm valuation

Indeed, past two decades has witnessed considerable upsurge of empirical work on the nexus of CG and FV, yet consensus on the same appears to be far till date. While one strand of literature exhibits significant positive impact of CG on FV, extending support to the dominant agency perspective (Brown and Caylor, 2006; Cheung *et al.*, 2007; Bauer *et al.*, 2008; Arora and

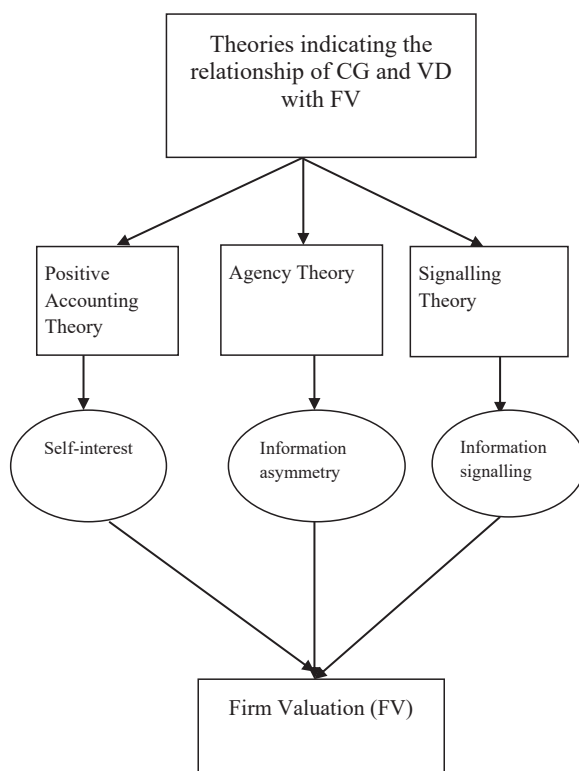


Figure 1.
Theoretical framework of CG, VD and FV

Bodhanwala, 2018), another body of literature contradicts the same by indicating no significant relationship between the two (Klein *et al.*, 2005; Bozec *et al.*, 2010; Akbar *et al.*, 2016). While empirical evidence portrays a mixed picture on the relationship between CG and FV, the dominant theoretical agency perspective strongly recommends for a sound governance mechanism for alignment of owners' interest with that of managers by way of performance-based rewards, contracts and other rules, which collectively assists in maximizing overall value for firms (Fama and Jensen, 1983). In this regard, Price *et al.* (2011) asserts that horizontal agency conflict present in many emerging markets can be reduced via stronger CG mechanism. In Indian context, the recent CG reforms encompasses a wide range of mechanisms for upholding minority investors' interest, yet existing work has repetitively examined only single/few variables of CG as its proxy measure (e.g. board size and board independence) (Dwivedi and Jain, 2005; Garg, 2007; Jackling and Johl, 2009; Arora and Sharma, 2016). Even though very few have captured CG in a holistic manner by developing CG index based on international standards or literature from developed countries (Goel and Ramesh, 2016; Arora and Bodhanwala, 2018), the success of such measure in capturing the real scenario of CG in Indian context remains skeptical as the prime agency issue in India is not same with that of developed countries. Thus, mixed evidence regarding performance impact of CG, particularly in case of India, should come as no surprise. In response to such contradictory as well as partial picture about the performance impact of CG, I attempt to examine the relationship between CG and FV by adopting a holistic approach wherein the prominent recently introduced CG mechanisms are included. Notwithstanding

the mixed empirical evidence, I consider the strong advocacy of agency theory in favor of overall CG framework to resolve the unique agency issues in India coupled with the enduring CG reforms in India with the ultimate objective of value creation, I hypothesize that:

H1. CG has a significant positive impact on FV.

2.2 Voluntary disclosure and firm valuation

There are several economic incentives for managers for making VD as posit by diverse theoretical perspectives. For instance, agency theory considers information asymmetry as the key conflict-causing element between minority and majority shareholders in Indian context and thereby suggests that firms can use VD to mitigate such conflict, which leads to better FV (Brockman *et al.*, 2010). Likewise, positive accounting theory argues that managers or firms particularly opt for such accounting and reporting practices, which improve their valuation, thereby providing the direction of using VD as a tool to improve FV, given the capital market benefit of VD as mentioned in the introduction section (Diamond and Verrecchia, 1991; Botosan, 1997; Healy and Palepu, 2001). In the similar vein, signaling theory also posits the role of VD in portraying superior image of the firm in the eyes of investors (Campbell *et al.*, 2001). Therefore, it can be inferred that there is a great level of convergence between diverse theoretical perspectives of VD in explaining its relevance in value creation of firms. However, despite such strong theoretical advocacies, the extent to which actual users of VD are likely to incorporate such information in their rational economic decision-making process has been of substantial interest during the last two decades (Saha and Kabra, 2021). The impact of VD on FV arises from either reducing cost of capital or facilitating financial performance prediction (Clarkson *et al.*, 2013). Within this framework, several studies provide evidence that VD have an impact in reducing cost of capital (Botosan, 1997; Botosan and Plumlee, 2002; Dhaliwal *et al.*, 2014; Plumlee *et al.*, 2015). These studies suggest that increased VD assists in reducing information asymmetry, estimation risk and monitoring cost whereby investors necessitate lower rate of return for their stock holding. Likewise, some studies reveal that firms disclose information voluntarily to make better informed assessment of expected future cash flows, and it is needless to say that stock prices are the slaves of cash flows. Accordingly, such superior assessment, in turn, positively influences the market performance of firms (Anam *et al.*, 2011; Al-Akra and Ali, 2012; Uyar and Kılıç, 2012; Cahan *et al.*, 2016). Yet, few studies from emerging market reports insignificant influence of VD in determining FV (Banghøj and Plenborg, 2008; Wang *et al.*, 2008; Hassan *et al.*, 2009; Dawd and Charfeddine, 2019), suggesting that the relation between VD and FV depends on the complex interplay of a number of conflicting factors like misinterpretation by investors, ineffective market and low level of disclosure. In particular, the value relevance of VD as a whole in the Indian context has been largely ignored so far in the existing literature, though few elements of it have been examined in few studies (Nag and Bhattacharyya, 2016; Laskar and Maji, 2018; Smriti and Das, 2018). Thus, irrespective of the mixed empirical evidence, I hunch that the relationship between overall VD and FV in Indian context to be positive based on the strong theoretical foundation, and accordingly, I formulate the following hypothesis:

H2. VD has a significant positive influence on FV.

2.3 Interaction of corporate governance and voluntary disclosure on firm valuation

The aforesaid discussion explains the standalone impact of CG and VD on FV. Regarding interaction effect of CG and VD on FV, barely any study has examined the same, particularly in Indian context, except for Enache and Hussainey (2020), who studied the joint effect of CG and product related VD on FV for USA listed biotechnology firms and reveal significant positive joint effect of the same on FV. In view of the relevance of both CG and VD in

influencing FV as evident from extant literature, it is pertinent to explore their interaction impact on FV as the two mechanisms could be complementary, substitutive or independent in their performance impact. The agency perspective suggests that as the nature of agency conflict in Indian context varies from the classical agency problem, CG and VD can have complementary or substitutive interaction impact on FV. The complementary hypothesis posits that interaction of VD with CG can have a positive impact on FV only when existing CG mechanisms are effective in controlling opportunistic behavior of block holders; thereby, blockholders will have less private information to hide, and hence, it will encourage them to make more VD and such increased level of VD will ultimately create a positive impact on overall FV (Patelli and Prencipe, 2007). On the contrary, substitutive hypothesis imply that the interaction of VD with CG can have negative impact on FV due to reduced level of VD if firm uses CG mechanisms as a substitute of VD because CG is mandatory in nature while VD is a discretionary action. Moreover, VD is associated with some costs (Healy and Palepu, 2001). However, if I combine the argument of substitutive hypothesis under agency theory with other theoretical perspectives of VD like positive accounting theory and signaling theory, such perspectives provide enough arguments in favor of making VD. Thus, the advantage of substituting VD with CG gets diluted given the various capital market benefits of VD, which will be ultimately reap by the substantial owners in Indian context as they are the holders of firms' lion share. In this regard, a plethora of empirical evidence documents complementary impact of CG on VD (Patelli and Prencipe, 2007; Donnelly and Mulcahy, 2008; Akhtaruddin and Haron, 2010; Albassam, 2014; Kaur *et al.*, 2016; Saha and Kabra, 2019). Accordingly, based on the convergence of diverse theoretical underpinnings as well as empirical literature, the following hypothesis is framed:

H3. There is a significant positive interaction impact of CG and VD on FV.

2.4 Mediation of voluntary disclosure in corporate governance and firm valuation

As the interaction effect only reveals the combined effect of CG and VD on FV, any causal sequence between these variables is not captured under such analysis. Accordingly, to know the indirect causal relationship between CG and FV, mediation analysis is necessary. The role of mediating variable in the relationship between CG and FV has been largely ignored except for few considering leverage, intellectual capital, board structure, etc. (Naseem *et al.*, 2019; Rashid, 2020; Shahwan and Fathalla, 2020) as mediating variables in such relationships. Thus, it provides an excellent opportunity to fill this gap by considering the voluntary aspect of corporate disclosure (VD) as the mediator in the relationship between CG and FV. In this regard, I choose to use VD as a mediating variable as it is associated with both CG and FV based on the theoretical framework as well as its practical relevance since the diverse theories as well as international corporate practices consider disclosure a crucial tool for reducing information asymmetries and improving market perception of firms. Moreover, I have taken into consideration the Baron and Kenny's (1986) framework of mediation after its modifications by Zhao *et al.* (2010), which suggest two conditions for undertaking mediation analysis: *first*, the link between independent variable and mediator variable must be significant, which can be presumed to be satisfied based on extant literature (Patelli and Prencipe, 2007; Donnelly and Mulcahy, 2008; Akhtaruddin and Haron, 2010; Albassam, 2014; Kaur *et al.*, 2016; Saha and Kabra, 2019); *second*, the link between mediating variable and dependent variable must be significant, which is again expected under H2 based the extant literature capital (Botosan, 1997; Botosan and Plumlee, 2002; Clarkson *et al.*, 2013; Dhaliwal *et al.*, 2014; Saha and Kabra, 2021). Thus, considering the strong advocacies of theoretical and empirical literature in favor of significant link between CG and VD and VD and FV and practical relevance of VD in the CG framework as well as market valuation of firms, I assert that CG is expected to have a positive impact on VD, which in turn makes a

positive contribution toward FV. This assertion is pictorially presented in [Figure 2](#): The impact of CG on FV through the mediation of VD [relation (a × b)]. Accordingly, the following hypothesis is framed.

H4. The relationship between CG and FV is significantly positively mediated by VD.

3. Methodology

3.1 Sample and data source

The study includes a sample of top 100 non-financial and non-utility firms based on market capitalization listed at Bombay Stock Exchange (BSE) as on March 31, 2014. The sample excludes financial and utility firms as additional regulations and reporting requirements are applicable to them (e.g.: Banking Regulation Act, 1949; Electricity Act, 2003). I purposively selected top 100 non-financial and non-utility firms as such firms constitute around 76% of BSE's [1] total market capitalization. Moreover, the sample under consideration can better serve the purpose of this study since large firms are more likely to adopt good governance and better disclosure practices owing to better resources availability (Meek *et al.*, 1995). The study covers a period of five years from 2013–2014 to 2017–2018 as CG framework in India is overhauled during the same period such as [Companies Act, 2013](#); SEBI's Revised Clause 49, 2014 and SEBI's LODR, Regulation, 2015. The CG and VD information are obtained by undertaking content analysis of sample firms' annual reports, while other financial data are obtained from corporate database called "Capitaline plus."

3.2 Measurement of variables

3.2.1 *Independent variable.* The measurement of independent variable under consideration, i.e. CG is done in two ways:

- (1) The first way of measurement is presented below:

Prior studies have largely used few individual variables of CG as its proxy measure (Jackling and Johl, 2009; Arora and Sharma, 2016; Kao *et al.*, 2019) and ignored the combined effect of different CG attributes, though it is considered to be the more effective way of capturing CG (Gompers *et al.*, 2003). Moreover, combined measure can be claimed to be the superior measure of CG as there exists a complementary and substitutive effect of different CG mechanisms (Chen *et al.*, 2007). Accordingly, based on the extant literature as well as prominent CG reforms in India, I have developed a comprehensive measure comprising of 12 CG attributes pertaining to board structure, ownership structure, board's sub committees and audit. Each of the attributes is measured as dichotomous variable and a value of "1" is

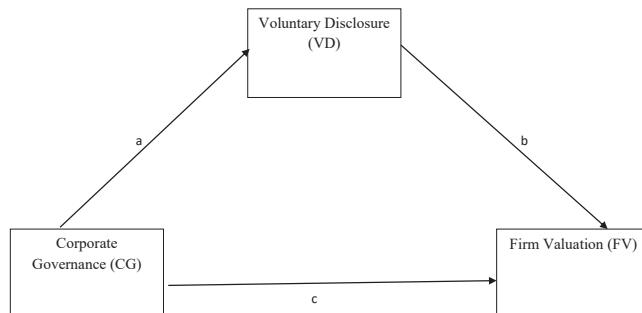


Figure 2.
The relationship between corporate governance, voluntary disclosure and firm valuation

assigned for presence of each CG attribute in the specific firm and otherwise "0." Then, score for each CG attribute are added to derive the final CG score of firms. This approach of scoring is additive and equally weighted and it is calculated as follows:

$$CG_Score_1_{it} = \frac{\sum_{i=1}^n X_{ijt}}{N_j} \times 100$$

Where "N_j" is the maximum CG_Score_1, i.e. equals to 12 in the present study; "j" denotes firms; "i" stands for CG attributes and "t" refers to time. "X_{ij}" scored as "1" for presence of ith CG attribute and "0" for absence of the same. Thus, $0 \leq X_{ij} \leq 1$.

A brief description of the different CG attributes under consideration is mentioned below:

Board size: Size of the board determines its effectiveness. According to agency and resource dependency perspective, monitoring capacity and other expertise of board increases with its size (Adams and Mehran, 2003; Hussainey and Wang, 2010). Likewise, studies from emerging market in general and India in particular indicate that large board brings a diversified pool of human capital as firms often lack such capital due to majority of family owned firms whereby board appointments are mostly made on the basis of family membership (Jackling and Johl, 2009; Sheikh et al., 2013). Therefore, I have measured this indicator as value equals "1" if the board size is between 10 to 15 members and otherwise "0." I decided the maximum board size in view of the requirement of prevailing regulation (Companies Act, 2013).

Board independence: Independent directors on board are considered as one of the conventional mechanisms of CG in mitigating agency conflict (Fama and Jensen, 1983). There exists plethora of evidence in support of the positive impact of board independence on VD (Huafang and Jianguo, 2007; Gisbert et al., 2014; Goh et al., 2016) and firm's market performance (Jackling and Johl, 2009; Kao et al., 2019). Indian CG regulation mandates 50% of board to be independent for listed firms and accordingly I have assigned a value of "1" for making compliance with the prevailing regulation, otherwise "0".

CEO duality: Agency perspective advocates for having separate individuals in the position of chief executive officer (CEO) and chairman in order to limit opportunistic behavior of board leaders (Jensen and Meckling, 1976). CG regulations across the globe also recommend the same for controlling autonomous power; hence, I measure this variable as "1" if CEO duality does not exist and "0" otherwise.

Boards' gender diversity: Theoretical perspectives like agency and resource dependency put forth diverse arguments for promoting board's gender diversity as it brings broader perspectives, leadership styles, better risk management (Schubert, 2006; Lucas-Pérez et al., 2015) and better diligence in monitoring (Adams and Ferreira, 2009). To reap such benefits, Companies Act, 2013 mandates gender quota on board of Indian listed firms. Hence, I assign a score of "1" for presence of minimum one women director on board, "0" otherwise.

Board qualification: Resource-dependence perspective indicates the importance of board as a provider of requisite expertise needed for efficient functioning of firms (Hillman and Dalziel, 2003). Hence, directors having professional qualifications in the area of accounting, finance, law and administration are likely to assist firm in smooth functioning including better CG and disclosure. Accordingly, I capture this indicator by assigning a value of "1" for having at least three directors having professional qualifications and "0" otherwise.

Promoters' shareholding: According to agency theory, concentration of ownership in the form of promoters' shareholding causes horizontal agency problems in emerging economies (Shleifer and Vishny, 1997) and India is no exception to it. However, to control such issues, breakthrough CG reforms have been in the past two decades, which created a better CG environment in India. Moreover, it has been observed in the prior work that the presence of a strong CG system can create incentives for disclosing more information under such a setting (Dyck and Zingales, 2004). In addition, it has also been argued by Dharwadkar et al. (2000)

that in the case of emerging economies such as India and China, a higher ownership concentration may substitute for the absence of strong external governance. Consistent with such arguments, many studies in case of emerging economics observed positive impact of concentrated ownership on both disclosure and firm performance (Singh and Gaur, 2009; Allegrini and Greco, 2013; Sheikh *et al.*, 2013). In this study, a value of “1” is assigned if more than 50% (majority) shareholdings belong to promoter “0” otherwise.

State shareholdings: Though closely-held ownership structure creates conflict of interest between majority and minority shareholders, chances of such conflict becomes less when the concentration takes place in the form of government ownership, as government is a body that is trusted by the public (Ghazali, 2007), and, thus their interventions generate pressures for firms to disclose additional information. Further, government involvement may also induce firms to operate in a socially responsible manner (Said *et al.*, 2009), which subsequently leads to positive impact on FV. Hence, I have assigned a value of “1” if more than 50% (majority) shareholdings belong to state “0” otherwise.

Foreign institutional investors (FII): Firms having more than 50% (majority) of FII may make more VD as the demand for such disclosure is greater due to geographical difference between FII and firms (Craswell and Taylor, 1992). Moreover, such firms possess better human capital expertise owing to representation of FII on board. For this indicator, I have assigned a value of “1” if the majority of shareholdings belong to FII and “0” otherwise.

Audit committee independence: Constitution of audit committee with the majority of independent members is crucial in upholding objectivity and independence of external auditors, which in turn lessens the likelihood of committing deceitful activities and improves firms’ overall reporting process and its market performance (Akhtaruddin and Haron, 2010). Accordingly, I assign a value of “1” for presence of audit committee with more than 50% independent members and “0” otherwise.

Nomination and remuneration Committee (NRC): The basic purpose for constitution of NRC is to exclude the influence of CEO or other executive members in decisions associated with selection and compensation of directors (Shivdasani and Yermack, 1999), hence such committee is likely to encourage better monitoring (Vafeas, 1999), which may contribute positively toward VD and FV. Thus, I assign a value of “1” for presence of NRC, otherwise “0”.

Risk management committee (RMC): Formation of a separate RMC solely for oversight of the risk management process makes its members accountable for the same, which in turn helps in safeguarding shareholders’ interest (Chatterjee and Bose, 2007). Thus, for presence of RMC, I assign a value of “1” and “0” otherwise.

Big4 auditors: Agency theory suggests that independent and big audit firms are capable of reducing the agency conflict by providing more reliable and credible information (Jensen and Meckling, 1976). Thus, I assign a value of “1” for presence of Big4 audit firms and “0” otherwise.

- (2) In the second way of measurement, I have made some modification to the CG_Score_1 developed in the first step as discussed below:

In my second way of measuring CG in a comprehensive manner, i.e. CG_Score_2, I have considered only board related variables comprising of nine CG attributes pertaining to board structure, board’s sub committees and audit, whereas the ownership structure is excluded. This index particularly emphasizes on board and audit as control mechanism, as CG reforms in India are largely focused on these areas for promoting good governance. Moreover, in context of a horizontal agency setting like India, wherein firms are dominated by substantial owners in the form of promoter, government and FIIs, a CG measure including both ownership structure variables and board related variables may not reveal the real contribution of board towards FV. However, under this unique agency setting, the variables pertaining to ownership structure cannot be entirely excluded while making any analysis on CG as it will cause omitted variable

bias, hence I opt to examine the impact of ownership structure variables in the form of promoter's shareholding, government shareholding and FIIs as individual variables computed in terms of percentage of their respective holdings to total capital and these variables are included alongside CG_Score_2 in the analysis.

Thus, CG_Score_2 is calculated as follows:

$$CG_Score_2_{it} = \frac{\sum_{i=1}^n X_{ijt}}{N_j} \times 100$$

Where "N_j" is the maximum CG_Score_2, i.e. equals to 9 in the present study; "j" denotes firms; "i" stands for CG attributes and "t" refers to time. "X_{ij}" scored as "1" for presence of ith CG attribute and "0" for absence of the same. Thus, $0 \leq X_{ij} \leq 1$.

3.2.2 Mediating variable. To capture the mediating variable in this study, i.e. VD, I have constructed a VD index (VDI) as its surrogate measure. I have followed certain steps in developing the VDI as mentioned below:

- (1) A broad review of the literature is done to prepare a comprehensive list of VD items, which resulted in accumulation of 131 items (Meek *et al.*, 1995; Botosan, 1997; Eng and Mak, 2003; Gul and Leung, 2004; Lim *et al.*, 2007; Patelli and Prencipe, 2007; Akhtaruddin *et al.*, 2009; Rouf, 2011; Charumathi and Ramesh, 2015).
- (2) I have excluded the mandatory items in Indian context by checking them against the prevailing regulations influencing the disclosure of sample firms over the study period, which leads to the elimination of 67 mandatory items [52 items under SEBI's (LODR) Regulation, 2015 and 15 items under the Companies Act, 2013]. Further, I have added five items from SEBI's (LODR) Regulation, 2015 [No. 27 (1)] due to their discretionary nature. The list reduced to 69 items (presented in Annexure).
- (3) In accordance with prior work (Adams and Hossain, 1998; Barako *et al.*, 2006), I took assistance from three practicing chartered accountants in finalizing the VDI as these persons are well versed with the dynamic disclosure regulations in India.

After deciding the items of VDI, I have embarked on the scoring approach. Majority of the studies followed unweighted approach of scoring wherein only presence or absence of a particular item is captured without looking into the quality aspect of it (Meek *et al.*, 1995; Lim *et al.*, 2007; Akhtaruddin *et al.*, 2009; Charumathi and Ramesh, 2015). Nevertheless, few studies used weighted index to consider quality aspect of disclosure, wherein scoring is done on the basis of two approaches: *first*, those items disclosed in comprehensive manner are assigned more scores (Wallace and Naser, 1995; Eng and Mak, 2003; Gul and Leung, 2004), and *second*, items disclosed in quantitative terms are assigned more scores due to their precise nature (Botosan, 1997; Patelli and Prencipe, 2007). Since, VD covers both financial and non-financial items, it is unlikely for firms to express all information in quantitative terms only as certain non-financial items such as corporate outlook, policy, strategy, etc. cannot be quantified and their importance cannot be undermined. Accordingly, I have adopted a weighted index in order to consider disclosure quality, wherein a combination of both the prior approaches of scoring has been used and a score of "0" is assigned for absence of information, "1" for partial disclosure of information and "2" for extensive disclosure [2]. Then, each firm's VDI score is calculated as a percentage of actual disclosure scores obtained against the maximum expected scores.

$$VDI_{it} = \frac{\sum_{i=1}^n X_{ijt}}{N_j} \times 100$$

Where “*i*” stands for VD item, “*j*” refers to company, “*N*” is the maximum expected VD scores, “*t*” refers to time and “ X_{ijt} ” assumes the score of “0-2” to capture quality of VD item.

3.3 Reliability and validity of CG index and VD index

The reliability as well as validity of both CG and VD indices can be justified by theoretical explanation as well as empirical tests as presented below:

First, the construct validity of both CG and VD indices can be justified from its broad dimensions used, i.e. 12 most important internal governance dimensions in case of CG like board size, board independence, CEO duality, board gender diversity, board qualification, promoter’s shareholding, state shareholding, FII, audit committee independence, NRC, RMC and Big4 audit firms in case of CG_Score_1 and 9 important board and audit attributes for CG_Score_2, while 5 broad categories of VD in case of VDI, i.e. CSDI, FWLDI, HICDI, CGDI and FCMDI [[Annexure](#)] ([Embretson, 2007](#)). The parameters are largely adopted based on Indian regulation as well as from some scholarly works from disclosure literature ([Meek et al., 1995](#); [Botosan, 1997](#); [Eng and Mak, 2003](#); [Gul and Leung, 2004](#); [Lim et al., 2007](#); [Ho and Taylor, 2013](#)).

Second, the content validity of CG and VD indices is also justified from the fact that it is not only based on some prominent works on literature from both developed and developing economies, but also all the possible items have been included after due consideration to the prevailing regulations as well as prior studies in Indian context ([Charumathi and Ramesh, 2015](#)).

Finally, to examine the criterion-related validity of the index, correlation analysis is performed between CG indices, VDI, FV and other firm-specific factors and the results are largely consistent with the extant literature, thus advocating in favor of criterion validity.

In addition to theoretical validation, I have used the Cronbach’s coefficient alpha ([Cronbach, 1951](#)) to assess the internal consistency of CG and VD indices. Cronbach’s alpha is a single correlation coefficient that is an estimate of the average of all the correlation coefficients of the items within a test. If alpha is high (0.80 or higher), then this suggests that all of the items are reliable and the entire test is internally consistent [Botosan \(1997\)](#). The coefficient alpha for the twelve items of information in CG_Score_1, nine items of information in CG_Score_2 and five information categories in VDI are 0.852, 0.869 and 0.874, respectively, which provides sufficient support that the set of items in the indices capture the same underlying construct.

In summary, the reliability and validity of the indices are supported by (1) theoretical arguments, (2) the correlations with some explanatory variables consistently with prior work and (3) the internal consistency among the components of the indices, which are measured by the Cronbach’s coefficient alpha.

3.3.1 Dependent variable. Firms’ Valuation is used as the dependent variable and I have measure it by using two prominent measurement of FV in the extant literature, namely (1) natural logarithm of market capitalization (LnMC) and (2) Tobin’s q proxied by book value of debt plus market value of common stock divided by book value of assets.

I opt for market-based measure rather than accounting measure as it reflects investors’ expectation about firms’ future prospect ([Wolfe and Sauaia, 2014](#)). However, accounting-based measure of firm performance, i.e. profitability, is used as control variable (discussed in next paragraph) as firm’s profitability numbers can significantly influence its disclosure and valuation.

3.3.2 Control variables. Parallel with the prior literature, I have considered several control variables that are likely to influence VD and FV. In particular, I include some firm-specific factors like firm size, firm age leverage, profitability and liquidity. Firm size is supposed to have positive influence on both VD and FV since large firms gets the benefit of better competitiveness and economics of scale ([Singh and Gaur, 2009](#)), while firms’ disclosure decision and market value may be influenced by their age, i.e. the stage of development, as younger companies may have to face high competition, high cost and difficulty in gathering, processing and disseminating the required information ([Jackling and Johl, 2009](#)). Contrarily, leverage can be expected to have

negative impact on FV as higher debt reduces controlling power of shareholders' (Dwivedi and Jain, 2005), while the same might influence VD positively as debt creates additional monitoring costs which can be mitigated through VD (Patelli and Prencipe, 2007). Similarly, profitability can be expected to have positive impact on VD and FV due to its signaling effect (Campbell *et al.*, 2001). Lastly, liquidity is also used as a control variable as better liquidity enables firms to operate smoothly, which can assist them in improving their disclosure as well as valuation (Balasubramanian *et al.*, 2010) (see Table 1).

3.4 Empirical model

3.4.1 For first, second and third hypotheses. To examine the performance impact of CG and VD, pooled ordinary least square (OLS) regression model is widely used (Hassan *et al.*, 2009; Uyar and Kılıç, 2012; Roy, 2016). However, pooled OLS regression model does not take into consideration the uniqueness/heterogeneity existing within each cross-section unit or time (Green, 2003) and thus fails to control for potential omitted bias due to firm-specific characteristic. Moreover, this study also conducted Breusch–Pagan Lagrange Multiplier (LM) test to know the suitability of using pooled OLS regression, wherein the outcome indicates that pooled OLS model is not appropriate for the data set. Further, to choose appropriate panel data model [fixed effect model (FEM) or random effect model (REM)], the outcome of Hausman specification test is considered.

While REM presumes that each cross-section units are random drawn from a large population, FEM allows each cross-section units to have their own intercept value. Within each cross-section unit, FEM investigates the relationship between predictor and outcome variables and thereby controls the bias caused by cross-sectional specific (time-invariant) factors so that the net effect of predictors on the outcome variable can be assessed over time. FEM also assumes that those cross-sectional specific (time-invariant) factors should be genuinely unique for each cross-section units and should not be related to other cross-section units. Thus, error term of each cross-section units and the constant, which captures cross-sectional characteristics, should not be correlated with the others. If the error terms are correlated, then inferences drawn from FEM may not be correct and an alternative model, i.e. REM can be adopted.

In order to choose between FEM and REM, Hausman test is performed wherein the null hypothesis states that the preferred model is REM and the alternative model is FEM (Green, 2003). The prime rationale is to test whether the unique cross-sectional errors are correlated with regressors. If they are found to be related, then the null hypothesis gets rejected and the FEM is considered as the most appropriate model and viceversa. In the present dataset the outcome of Hausman test, Chi-Square (χ^2) is highly significant in all the models, which rejects the null hypothesis, and thus, the outcome advocates in favor of using FEM.

The functional form of FEM is as follows:

$$Y_{it} = \beta X_{it} + \alpha_i + u_{it}$$

Where α_i is the unknown intercept for each firm and u_{it} denotes the error term.

Variables	Acronyms	Measurement
Firm Size	Ln_FSIZE	Natural logarithm of total sales
Firm Age	Ln_FAGE	Natural logarithm of years since incorporation
Leverage	LEV	Ratio of total debt by total asset
Profitability	PROF	Ratio of profit after interest and taxes by total equity capital
Liquidity	LIQ	Ratio of current asset and loans by current liabilities

Table 1. Measurement of control variables

The following models are employed to examine the standalone as well as the joint impact of CG_Score_1 and VD on FV after controlling the impact of firm-specific factors.

$$\begin{aligned} \text{Ln_MCAP}_{it} = & \beta_1 \text{CG_Score_1}_{it} + \beta_2 \text{VD_Score}_{it} + \beta_3 \text{CG_Score_1} * \text{VD_Score}_{it} \\ & + \beta_4 \text{Ln_FSIZE}_{it} + \beta_5 \text{Ln_FAGE}_{it} + \beta_6 \text{LEV}_{it} + \beta_7 \text{PROF}_{it} + \beta_8 \text{LIQ}_{it} + \alpha_i \\ & + u_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Tobin's } Q_{it} = & \beta_1 \text{CG_Score_1}_{it} + \beta_2 \text{VD_Score}_{it} + \beta_3 \text{CG_Score_1} * \text{VD_Score}_{it} \\ & + \beta_4 \text{Ln_FSIZE}_{it} + \beta_5 \text{Ln_FAGE}_{it} + \beta_6 \text{LEV}_{it} + \beta_7 \text{PROF}_{it} + \beta_8 \text{LIQ}_{it} + \alpha_i + u_{it} \end{aligned} \quad (2)$$

Where $\beta_1 \dots \beta_8$ are the slopes of CG, VD, interactive effect of CG and VD and firm characteristics; α_i is the intercept for each firm; u_{it} is the error term; "i" = 1, . . . , 100 sample firms and "t" = 2014–2018.

Further, the same analysis has been undertaken with alternative measurement of CG, i.e. CG_Score_2 including only board- and audit-related variables, while ownership structure variables are considered separately. The, the following equation is employed.

$$\begin{aligned} \text{Ln_MCAP}_{it} = & \beta_1 \text{CG_Score_2}_{it} + \beta_2 \text{VD_Score}_{it} + \beta_3 \text{CG_Score_2} * \text{VD_Score}_{it} \\ & + \beta_4 \text{Ln_PROMO}_{it} + \beta_5 \text{GOV}_{it} + \beta_6 \text{FII}_{it} + \beta_7 \text{Ln_FSIZE}_{it} + \beta_8 \text{Ln_FAGE}_{it} \\ & + \beta_9 \text{LEV}_{it} + \beta_{10} \text{PROF}_{it} + \beta_{11} \text{LIQ}_{it} + \alpha_i + u_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Tobin's } Q_{it} = & \beta_1 \text{CG_Score_2}_{it} + \beta_2 \text{VD_Score}_{it} + \beta_3 \text{CG_Score_2} * \text{VD_Score}_{it} \\ & + \beta_4 \text{Ln_PROMO}_{it} + \beta_5 \text{GOV}_{it} + \beta_6 \text{FII}_{it} + \beta_7 \text{Ln_FSIZE}_{it} + \beta_8 \text{Ln_AGE}_{it} \\ & + \beta_9 \text{LEV}_{it} + \beta_{10} \text{PROF}_{it} + \beta_{11} \text{LIQ}_{it} + \alpha_i + u_{it} \end{aligned} \quad (4)$$

Further, to ensure robustness of the findings obtained from FEM, I have employed instrumental variable regression. In particular, the following model is employed for robustness check.

$$\begin{aligned} \text{Ln_MCAP}_{it} = & \beta_0 + \beta_1 \text{CG_Score_2}_{it} + \beta_2 \text{VD_Score}_{it} + \beta_3 \text{CG_Score_2} * \text{VD_Score}_{it} \\ & + \beta_4 \text{Ln_PROMO}_{it} + \beta_5 \text{GOV}_{it} + \beta_6 \text{FII}_{it} + \beta_7 \text{Ln_FSIZE}_{it} + \beta_8 \text{Ln_FAGE}_{it} \\ & + \beta_9 \text{LEV}_{it} + \beta_{10} \text{PROF}_{it} + \beta_{11} \text{LIQ}_{it} + u_{it} \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Tobin's } Q_{it} = & \beta_0 + \beta_1 \text{CG_Score_2}_{it} + \beta_2 \text{VD_Score}_{it} + \beta_3 \text{CG_Score_2} * \text{VD_Score}_{it} \\ & + \beta_4 \text{Ln_PROMO}_{it} + \beta_5 \text{GOV}_{it} + \beta_6 \text{FII}_{it} + \beta_7 \text{Ln_FSIZE}_{it} + \beta_8 \text{Ln_FAGE}_{it} \\ & + \beta_9 \text{LEV}_{it} + \beta_{10} \text{PROF}_{it} + \beta_{11} \text{LIQ}_{it} + u_{it} \end{aligned} \quad (6)$$

Where $\beta_0 \dots \beta_{11}$ are the slopes of CG, VD, interactive effect of CG and VD and firm characteristics; u_{it} is the error term; “ i ” = 1, . . . , 100 sample firms and “ t ” = 2014–2018.

3.4.2 *For fourth hypothesis.* Though empirical analysis on mediation are generally based on [Baron and Kenny’s \(1986\)](#) approach of full mediation as the gold standard, for examining whether VD mediates the relationship between CG and FV I have considered the modifications and improvements suggested by [Zhao et al. \(2010\)](#) in [Baron and Kenny’s \(1986\)](#) regression approach. According to [Baron and Kenny \(1986\)](#), there are three steps of mediation as follows: (1) regressing mediating variable on the independent variables, whereby independent variables is expected to have significant impact; (2) regressing dependent variable on independent variables, whereby independent variables is expected to be significant and (3) regressing dependent variable on both independent variables and mediator, whereby mediator is expected to be statistically significant and the independent variable is expected to become insignificant. However, [Zhao et al. \(2010\)](#) exhibits that the only requirement for testing mediation is significance of the indirect effect, while significant relationship between independent variable and dependent variable as mentioned in [Baron and Kenny \(1986\)](#)’s approach is not crucial and can provide misleading inference as it represents the total effect of the sum of direct and indirect effects, including the mediator. Further, [Zhao et al. \(2010\)](#) also contend that direct path can remain unexplained in mediation analysis and such direct impact may be attributed to some omitted mediator that can be considered in future research. Thus, I have employed the following two empirical models for testing the mediating impact of VD in CG and FV relationship:

$$VD_Score_{it} = \beta_1 CG_Score_1_{it} + \beta_2 Ln_FSIZE_{it} + \beta_3 LEV_{it} + \beta_4 PROF_{it} + \alpha_i + u_{it} \quad (7)$$

$$Ln_MCAP_{it} = \beta_1 CG_Score_{it} + \beta_2 VD_Score_{it} + \beta_3 Ln_FSIZE_{it} + \beta_4 LEV_{it} + \beta_5 PROF_{it} + \alpha_i + u_{it} \quad (8)$$

$$VD_Score_{it} = \beta_1 CG_Score_2_{it} + \beta_2 Ln_FSIZE_{it} + \beta_3 LEV_{it} + \beta_4 PROF_{it} + \alpha_i + u_{it} \quad (9)$$

$$Tobin's\ Q_{it} = \beta_1 CG_Score_{it} + \beta_2 VD_Score_{it} + \beta_3 Ln_FSIZE_{it} + \beta_4 LEV_{it} + \beta_5 PROF_{it} + \alpha_i + u_{it} \quad (10)$$

Where $\beta_1 \dots \beta_5$ are the parameters of explanatory variables, α_i is the intercept for each firm, u_{it} is the residual term, “ i ” refers to the number of sample firms i.e. $i = 1, \dots, 100$ and “ t ” denotes the time period, i.e. “ t ” = 2014–2018.

First, I have performed the Durbin–Wu–Hausman’s (DWH) test ([Chmelarova and Hill, 2010](#)) to check for potential endogeneity in the relationship between CG, VD and FV. The insignificant values of Durbin chi-square and Wu–Hausman F-Statistic in case of VD and FV imply that endogeneity does not prevail in the relationship under consideration. Second, to identify the appropriate panel data model, “Breusch–Pagan LM” is performed and its highly significant chi-square value advocates in favor of REM over pooled OLS model. Finally, to select between fixed effect and random effect panel data model, “Hausman Specification” test is undertaken, wherein the outcome suggests that FEM is appropriate for the present dataset.

4. Results and discussion

4.1 Descriptive statistics

The descriptive statistics for all the variables under consideration is presented in [Table 2](#). The CG_Score_1 indicates mean value of 58.38 with a range of 16.66–83.33, implying a wide

Variables	Mean	Standard deviation	Minimum	Maximum
CG_Score_1 (%)	58.38	11.77	16.66	83.33
CG_Score_2 (%)	51.08	12.51	20.08	85.17
VD_Score (%)	34.15	8.86	11.53	67.69
Ln_MCAP	4.51	0.44	2.83	5.74
Tobin's Q	2.27	1.73	0.32	12.81
PROMO	39.75	28.15	0	78.14
GOV	9.59	23.08	0	80.01
FII	12.11	18.71	0	42.18
Ln_FSIZE	3.95	0.58	2.31	5.68
Ln_FAGE	1.57	0.24	0.84	2.85
LEV	0.31	0.43	0	2.3
PROF	19.54	17.83	-20.36	105.12
LIQ	1.46	1.15	0.22	7.81

Table 2.
Descriptive statistics

variation among sample firms in terms of overall CG. Likewise, CG_Score_2 also indicates disparity among sample firms in terms of their board structure as CG_Score_2 particularly emphasizes on board related variables. In the similar vein, variability among sample firms is pretty high in terms of VD as indicated by its standard deviation value, while market valuation measured by both Ln_MCAP as well as Tobin's Q exhibits less variability among the sample firms. Three ownership structure variables that are excluded from CG_Score_2 and considered as individual variable, i.e. PROMO, GOV and FII, reveal higher level of variability, wherein concentration of ownership in the form of PROMO is highest followed by FII and GOV. Regarding firm-specific factors like Ln_FSIZE, Ln_FAGE, LEV and LIQ, there exists lesser variation as suggested by their standard deviation values, while they are widely scattered in terms of PROF.

4.2 Correlation analysis

The Pearson's correlation analysis among variables under consideration is presented in Table 3. The objective of undertaking correlation analysis is to get an idea about the bivariate relationship between the response variables and different explanatory variables under consideration. In addition, correlation analysis also exhibits the degree of collinearity that exists between explanatory variables, since employment of classical linear regression model is based on the prime assumption of low level of collinearity between the explanatory variables/regressors. The correlation matrix reveals significant positive correlation of Ln_MCAP with different explanatory variables like CG_Score_1, CG_Score_2, VD_Score, PROMO, FII, Ln_FSIZE and PROF, thus supporting the diverse theoretical perspectives discussed in the literature review section. Consistent with the bivariate relationship of Ln_MCAP, another response variable, i.e. Tobin's Q, also reveals the same kind of relationship with different CG and firm-specific variables under consideration. An observation into the correlation matrix reveals the correlation coefficients between explanatory variables are not high, thus indicating low level of collinearity among regressors. Nevertheless, the correlation between Ln_MCAP and Tobin's Q is fairly high, as both measures the same construct (one been the absolute measure while the other is the relative measure of FV). However, as both are used as response variables in different models, higher level of correlation between them is not a cause of concern. Furthermore, these correlation statistics are consistent with the extant literature and thus also supports criterion validity of both the CG and VD indices.

Variables	Ln_MCAP	Tobin's Q	CG_Score1	CG_Score2	VD_Score	PROMO	GOV	FII	LnFSIZE	LnFAGE	LEV	PROF	LIQ
Ln_MCAP	1												
Tobin's Q	0.89***	1											
CG_Score1	0.22**	0.25*	1										
CG_Score2	0.34**	0.31***	0.79**	1									
VD_Score	0.48**	0.56**	0.12*	0.15*	1								
PROMO	0.35***	0.28***	0.67*	0.18*	0.05	1							
GOV	0.21	0.12	0.31	0.11	0.17	-0.16*	1						
FII	0.26*	0.23*	0.49*	0.09*	0.28*	-0.11*	0.19	1					
LnFSIZE	0.61*	0.56*	0.219*	0.31**	0.44*	0.49*	0.37*	0.41*	1				
LnFAGE	0.45	0.41	0.18	0.11	0.08	0.36*	0.41*	0.35	0.21	1			
LEV	-0.16**	-0.12*	0.12	0.21*	0.12*	-0.11*	0.26*	0.17	0.24*	0.13	1		
PROF	0.22*	0.31*	0.23*	0.19*	-0.01	0.39*	0.18	0.21*	0.13	0.16	0.35*	1	
LIQ	0.31	0.19	0.04	0.06	0.12*	0.14	0.07	0.05*	0.11*	0.08	0.14*	0.12	1

Note(s): ***, ** and * indicate significant at 1, 5 and 10%, respectively

Table 3. Correlation analysis

4.3 Result of regression analysis

The regression result pertaining to the standalone and interaction impact of overall CG using CG_Score_1 and VD on both the measures of FV is presented in Table 4. Following the outcome of Hausman test, the estimation is made using FEM. There are two issues that can affect the estimate of FEM such as heteroscedasticity and serial correlation of the residual term. The prevalence of such issues provides incorrect standard error associated with each regression coefficient (Gujarati, 2003). Accordingly, I have checked for these issues by undertaking White's test of heteroscedasticity and run-test of serial correlation and the results are reported in Table 4. The test suggests that issue of heteroscedasticity and serial correlation are present in the model. Accordingly, I have estimated the regression results by using robust standard error, which takes care of the standard error and t-statistic in presence of heteroscedastic and serially correlated residuals. The highly significant F-statistic values advocates in favor of predictive power of the model. In view of the fulfillment of different assumptions of FEM, the results obtained can be considered tenable.

The finding reveals that CG_Score_1 has a highly significant positive impact on Ln_MCAP, while the same documents an insignificant impact on Tobin's Q. The possible reason for such inconsistent impact of CG on different measures of FV might be due to inclusion of both ownership structure variables and board related attributes under CG_Score_1, which have undermined board's effectiveness as ownership concentration in the form of PROMO, GOV or FII and creates dominance over board affairs and reduces the autonomy of independent directors and auditors, thus reducing overall effectiveness of CG_

Variables	Using Ln_MCAP as dependent variable (Model 1)		Using Tobin's Q as dependent variable (Model 2)	
	Coefficient	t-statistics	Coefficient	t-statistics
CG_Score_1	0.041	3.18***	0.052	2.98
VD_Score	0.009	4.19***	0.007	3.89***
CG_Score1*VD (Interactive Effect)	0.108	7.18***	0.089	6.17*
Ln_FSIZE	0.461	7.47***	0.387	6.27***
Ln_FAGE	0.217	5.98	0.196	4.23
LEV	-0.279	-5.36***	-0.192	-4.71**
PROF	0.023	2.17***	0.047	0.22**
LIQ	0.046	3.19	0.021	2.19
Constant	1.794	6.28***	1.83	7.22***
R ² Overall	0.520		0.4916	
F-Statistic	42.54***		40.51***	
B-P LM test (χ^2)	629.27***		423.17***	
Hausman test (χ^2)	16.84***		14.91***	
White's test of Heteroscedasticity (χ^2)	135.31***		128.63***	
Run-test for serial correlation (z-statistic)	-9.21***		-7.48***	
DWH test of Endogeneity:				
Durbin (χ^2)	1.764 ($p = 0.1268$)		1.547 ($p = 0.1463$)	
Wu-Hausman F-statistic	1.712 ($p = 0.1934$)		1.612 ($p = 0.1621$)	

Note(s):

- (1) ***, ** and * indicates significance at 1, 5 and 10%, respectively
- (2) F-statistic: Goodness of fit
- (3) Breusch and Pagan's (1980) Lagrange Multiplier (BP-LM) statistic (Ho: Pooled OLS model is appropriate against the random effects model)
- (4) White's test of Heteroscedasticity: (H₀: Constant variance of the residuals)
- (5) Run-test of serial correlation (H₀: No serial correlation)
- (6) Hausman (1978) specification test (χ^2) (H₀: Fixed effect model is appropriate over random effect)
- (7) Durbin-Wu-Hausman test of Endogeneity (H₀: No endogeneity)

Table 4. Result of standalone and interactive effect of CG and VD on FV

Score_1 in influencing the relative measure of FV, i.e. Tobin's Q. Regarding VD, consistent with the hypothesized relationship in H2, VD_Score is observed to have a highly significant positive impact on both the measures of FV. This implies that VD made by Indian firms has the capacity to influence stock prices by providing superior information. This finding substantiates the result of previous studies conducted in some other emerging markets such as Malaysia (Anam *et al.*, 2011) and Turkey (Uyar and Kılıç, 2012). Interestingly, the outcome documents the highly significant positive interaction effect of CG_Score1 and VD on Ln_MCAP, while their interaction impact on Tobin's Q is marginal, possibly due to the reason cited above. Firm characteristics like Ln_FSIZE and PROF exhibit significant positive impact on both the measures of FV (Singh and Gaur, 2009), while leverage reveals significant negative on the same (Dwivedi and Jain, 2005).

Given the inconsistent impact of CG as per CG_Score_1 on diverse measurement of FV, the final decision as to hypotheses H1 and H3 cannot be made only based on the observations unveiled by CG_Score_1. This necessitates undertaking some additional analysis with an alternative measurement of CG, i.e. CG_Score_2, wherein only board- and audit-related variables are considered, while ownership structure variables such as promoter's shareholding (PROMO), government shareholding (GOV) and FII are excluded. The prime rationale to go for this additional analysis is to know the effectiveness of recent CG reforms in Indian context with a major emphasis on board and audit as control mechanism in influencing different measures of FV. However, in a horizontal agency setting like India, I cannot ignore the role of substantial owners in influencing FV; hence, I opt to use such variables as standalone variable in terms of percentage of their respective holdings to total capital in the analysis.

The results obtained by using alternative measurement of CG, i.e. CG_Score_2 are presented in Table 5. The findings reveal that CG_Score_2 has highly a significant positive impact on both the measures of FV, thus extending support to H1 as well as empirical findings of Brown and Caylor (2006), Cheung *et al.* (2007) and Arora and Bodhanwala (2018). Thus, it can be inferred that the board-level CG reforms that are initiated in the last decade is capable of protecting the minority shareholders in a horizontal agency setting only when they works in isolation without the interference of substantial shareholders. Hence, this finding does not provide sufficient evidence to reject H1. Regarding VD_Score, it documents a highly significant positive impact on both the measures of FV under additional analysis as well, thus substantiating the consistent value adding role of VD while considered under different CG framework. Interestingly, the interactive effect of CG and VD becomes highly significant on both the measures of FV, while such effect is observed with CG_Score_2, thus extending support to the hypothesized relationship in H3. This finding also implies that board-level CG mechanisms and VD complements each other to create an overall positive impact on FV. Moreover, it can also be inferred that Indian firms do not use existing board mechanism as a substitute of VD, given the multiple economic benefits of VD as advocated under diverse theories. Additionally, PROMO is observed to have a highly significant positive impact on both FV measures, thus extending support to the argument of Dharwadkar *et al.* (2000) that in the case of emerging economies a higher ownership concentration may substitute for the absence of strong external governance. Moreover, such concentration in the form of PROMO may assist in keeping market value of firms intact as they are the major beneficiary for such value (Singh and Gaur, 2009). However, GOV is observed to have an insignificant impact on both FV measures, indicating an inactive participation of government officials in the management of their major holdings. FII reveals marginally significant positive impact of FV, possibly owing to moderate level of FII's investment in Indian firms as indicated by its mean value in the descriptive statistics section. The results pertaining to firm-specific variables remain consistent as that of the previous analysis.

Variables	Using Ln_MCAP as dependent variable (Model 3)		Using Tobin's Q as dependent variable (Model 4)	
	Coefficient	t-statistics	Coefficient	t-statistics
CG_Score_2	0.072	4.11***	0.046	2.86**
VD_Score	0.011	4.19***	0.009	3.97***
CG_Score2*VD (Interactive Effect)	0.192	7.58***	0.068	7.16***
PROMO	0.089	7.15***	0.081	6.98**
GOV	0.015	4.56	0.032	4.12
FII	0.027	5.71*	0.031	6.04*
Ln_FSIZE	0.491	7.26***	0.418	5.89***
Ln_FAGE	0.217	5.98	0.128	4.91
LEV	-0.279	-4.27***	-0.316	-5.34**
PROF	0.081	1.98***	0.026	0.31**
LIQ	0.041	2.91	0.017	2.45
Constant	1.569	6.79***	2.91	8.62***
R ² Overall	0.537		0.552	
F-Statistic	45.68***		47.28***	
B-P LM test (χ^2)	561.28***		598.56***	
Hausman test (χ^2)	17.82***		15.18***	
White's test of Heteroscedasticity (χ^2)	145.91***		169.21***	
Run-test for serial correlation (z-statistic)	-8.25***		-6.89***	
DWH test of Endogeneity:				
Durbin (χ^2)	1.762 ($p = 0.1729$)		1.689 ($p = 0.1691$)	
Wu-Hausman F-statistic	1.812 ($p = 0.1821$)		2.216 ($p = 0.1756$)	
Note(s):				
(1) ***, ** and * indicates significance at 1, 5 and 10%, respectively				
(2) F-statistic: Goodness of fit				
(3) Breusch and Pagan's (1980) Lagrange Multiplier (BP-LM) statistic (H ₀ : Pooled OLS model is appropriate against the random effects model)				
(4) White's test of Heteroscedasticity: (H ₀ : Constant variance of the residuals)				
(5) Run-test of serial correlation (H ₀ : No serial correlation)				
(6) Hausman (1978) specification test (χ^2) (H ₀ : Fixed effect model is appropriate over random effect)				
(7) Durbin-Wu-Hausman test of Endogeneity (H ₀ : No endogeneity)				
Using Alternative measure of CG, i.e. CG_Score2 along with individual ownership structure variables				

Table 5.
Result of standalone and interactive effect of CG and VD on FV

Both the models employed in this section appear to be well fitted as evident from their R-square values and highly significant F-statistic values. Further, the different assumptions of using FEM have been satisfied and remedial measures are undertaken for the presence of autocorrelation and heteroscedasticity in the present data set. Hence, the results can be considered tenable.

To ensure robustness of the findings obtained from FEM, I have employed instrumental variables regression model and the results are presented in [Table 6](#). For the purpose of robustness test, I have considered CG_Score_2 only along with individual ownership structure variables as it has revealed consistent result while examined on both the measures of FV. The models employing Ln_MCAP and Tobin's Q as response variables indicate R-square of 54.20 and 56.20% and highly significant Wald-chi-square of 432.21 and 481.28, respectively, which advocates in favor of goodness of fit of the models. The outcome obtained from instrumental variables regression model is largely consistent with that of FEM, thus confirming the fact that board-level CGs, i.e. CG_Score_2 and VD, have a highly significant positive impact on different measures of FV. Moreover, their interaction complements each other to make a highly significant positive contribution towards FV. Further, ownership concentration in the form of PROMO positively contributes toward FV in Indian context,

Variables	Using Ln_MCAP as dependent variable (Model 5)		Using Tobin's Q as dependent variable (Model 6)	
	Coefficient	t-statistics	Coefficient	t-statistics
CG_Score_2	0.045	3.81***	0.038	2.81**
VD_Score	0.021	4.98***	0.014	4.69***
CG_Score2*VD (Interactive Effect)	0.086	7.38***	0.071	7.95***
PROMO	0.097	7.86***	0.098	7.16**
GOV	0.019	5.61	0.014	3.86
FII	0.025	5.44**	0.056	6.76*
Ln_FSIZE	0.561	7.92***	0.491	5.45***
Ln_FAGE	0.274	4.76	0.367	4.23
LEV	-0.189	-3.37***	-0.483	-5.74**
PROF	0.071	1.76***	0.046	0.38**
LIQ	0.046	2.06	0.024	2.86
Constant	1.784	6.59***	2.53	8.21***
R ² Overall	0.542		0.562	
Wald χ^2	432.21***		481.28***	
B-P LM test (χ^2)	468.28***		347.16***	
Hausman test (χ^2)	18.26***		14.26***	
White's test of Heteroscedasticity (χ^2)	152.67***		149.29***	
Run-test for serial correlation (z-statistic)	-7.65***		-7.81***	
DWH test of Endogeneity:				
Durbin (χ^2)	1.546 ($p = 0.1257$)		1.567 ($p = 0.2153$)	
Wu-Hausman F-statistic	1.683 ($p = 0.1345$)		2.814 ($p = 0.1484$)	
Test of weak instrument:				
Minimum eigenvalue statistic	156.83		149.39	
Test of over-identifying restriction				
Sargan (χ^2)	41.23 ($p = 0.2187$)		39.68 ($p = 0.2860$)	
Basmann (χ^2)	43.76 ($p = 0.3543$)		35.89 ($p = 0.4632$)	

Note(s):
(1) ***, ** and * indicates significance at 1, 5 and 10%, respectively
(2) Wald χ^2 : Goodness of fit
(3) White's test of Heteroscedasticity: (H_0 : Constant variance of the residuals)
(4) Run-test of serial correlation (H_0 : No serial correlation)
(5) Test of weak instrument (H_0 : No correlation between instrumental variables and regressors)
(6) Test of over-identifying restriction (H_0 : No correlation between instrumental variables and error term)

Table 6. Result of instrumental variables regression model (Robustness test)

while FII makes marginal positive contribution toward the same. However, GOV has no significant impact on FV.

Furthermore, the results obtained from instrumental variables regression model cannot be considered superior to panel data model estimates if the chosen instrumental variables are not correct. It is evident from prior studies that selecting suitable instrumental variables is challenging as it is not easy to get such instruments, which are associated with regressor variables but not with error terms (Kao *et al.*, 2019). Based on literature, this study uses one-year lagged values of CG_Score_2, VD_Score and PROF as instruments. Subsequently, suitability of the selected instrumental variables is examined on two conditions. *First*, relevance condition: the instrumental variables should be associated with the regressors, which are verified through the test of weak instruments. Second, exclusion condition: the instrumental variables should not be correlated with the error terms, which are examined through the test of over-identifying restrictions. The result of test of weak instruments obtained from minimum eigenvalue statistic of 156.83 and 149.39 implies considerable explanatory power of the instrumental variables for the regressors [3], i.e. CG_Score_2 and

VD_Score, and hence, these chosen instrumental variables cannot be considered as weak. Further, to test the exclusion condition, Sargan and Basman statistics are computed, wherein insignificant values of both Sargan chi-square 41.23 ($p = 0.2187$) and 39.68 ($p = 0.2860$) and Basman chi-square 39.68 ($p = 0.2860$) and 35.89 ($p = 0.4632$) for Ln_MCAP and Tobin's Q, respectively, imply that the chosen instrumental variables are not associated with the error terms, thus confirming their validity. Hence, my overall results are tenable.

For the purpose of testing the **fourth hypothesis**, initial analysis has been undertaken by using CG_Score_1 as independent variable, while VD_Score and FV in terms of Ln_MCAP are treated as dependent variables in case of **models 7** and **8**, respectively. In this analysis (**Table 7**), I have not used FV in terms of Tobin's Q, as CG_Score_1 revealed insignificant impact on the same in the previous analysis. However, to know the indirect relationship between CG and FV in terms of Tobin's Q, through the mediation VD, I have used CG_Score_2 as its proxy measure in the following part. The highly significant F-statistic values advocates in favor of predictive power of both the models. The finding given in **Table 7** exhibits that CG_Score_1 has a highly significant positive impact on the mediating variable (VD_Score) under **model (7)**, while control variables such as Ln_FSIZE and PROF show positive and negative impacts on VD, respectively. When CG_Score_1, VD_Score along with control variables are included in **model (8)**, CG_Score_1 reveal significant positive direct impact on FV in terms of Ln_MCAP (path c), while VD_Score documents significant positive impact on the same. Thus, the indirect effect ($a \times b$) in **Figure 1** is 0.138. As the significance of direct impact prevails simultaneously with indirect impact, such indirect/mediation impact can be inferred as partial mediation impact.

Variables	Model 3 (Mediating variable = VD score)		Model 4 (Dependent variable = Ln_MCAP)	
	Coefficient	t-statistic	Coefficient	t-statistic
CG_Score_1	0.157	3.99***	0.335	2.97***
VD_Score			0.883	3.74***
Ln_FSIZE	14.99	2.88***	0.547	3.58***
LEV	0.5105	0.22	-0.210	-3.86***
PROF	-0.0754	-1.96**	0.022	2.36**
Constant	-32.72	-1.63	1.880	3.18**
R ² Overall		18.59		54.51
F-statistic		22.28***		15.42***
B-P LM test (χ^2)		472.28***		629.12***
Hausman test (χ^2)		38.60***		11.66***
White's test of Heteroscedasticity (χ^2)		164.33***		162.33***
Run-test for serial correlation (z-statistic)		-11.91***		-13.16***
DWH test of Endogeneity:				
Durbin (χ^2)		1.64443 ($p = 0.1997$)		1.27986 ($p = 0.2579$)
Wu-Hausman F-statistic		1.63884 ($p = 0.2012$)		1.27434 ($p = 0.2596$)

Note(s):

- (1) ***, ** and * indicate significant at 1, 5 and 10%, respectively
- (2) Figures within parentheses indicate robust standard errors
- (3) F-statistic: Goodness of fit
- (4) **Breusch and Pagan's (1980)** Lagrange Multiplier (BP-LM) statistic (H_0 : Pooled OLS model is appropriate against the random effects model)
- (5) White's test of Heteroscedasticity: (H_0 : Constant variance of the residuals)
- (6) Run-test of serial correlation (H_0 : No serial correlation)
- (7) **Hausman (1978)** specification test (χ^2) (H_0 : Fixed effect model is appropriate over random effects)
- (8) Durbin-Wu-Hausman test of Endogeneity (H_0 : No endogeneity)

Table 7. Mediation of VD in CG FV relationship

To check the significance of partial mediation impact of VD in the relationship between CG and FV, I have employed a powerful and rigorous bootstrap test with no distributional assumption (with 5,000 bootstrap samples) as compared to the conservative Sobel test (Preacher and Hayes, 2008; Zhao *et al.*, 2010). The outcome reveals that the partial mediation impact is positive and significant with a bias corrected 95% confidence intervals excluding zero (0.61, 0.38). Since both direct and partial indirect impact are significant and both are positive, i.e. $a \times b \times c$ is 0.046, such mediation is termed as partial complementary mediation (Zhao *et al.*, 2010; Sheko and Braimllari, 2018). It indicates that the mediator identified in the study, i.e. VD, is consistent with the hypothesized theoretical framework; yet, there is a likelihood of omitted mediator in the direct path.

Further, to know the indirect relationship between CG and FV through the mediation of VD, when FV is measured in terms of a relative measure, i.e. Tobin's Q, I have done an additional analysis, wherein CG_Score_2 is used as a surrogate measure of CG, while FV is measured in terms of Tobin's Q and the mediating variable, i.e. VD, remains the same along with the control variables and the results are presented in Table 8. The finding reveals that CG_Score_2 has a highly significant positive impact on the mediating variable (VD_Score) under model (9). In the second step when CG_Score_2, VD_Score along with control variables are included in model (10), CG_Score_2 reveals a significant positive direct impact on FV in terms of Tobin's Q (path c), while VD_Score documents a significant positive impact on the same. Thus, the indirect effect ($a \times b$) in Figure 1 is 0.192. Parallel to the previous analysis, CG_Score_2 also has a significant direct impact on FV in terms of Tobin's Q, together with the

Variables	Model 3 (Mediating variable = VD score)		Model 4 (Dependent variable = Tobin's Q)	
	Coefficient	t-statistic	Coefficient	t-statistic
CG_Score_2	0.216	4.56***	0.359	2.97***
VD_Score			0.891	3.71***
Ln_FSIZE	16.18	3.76***	12.42	4.11***
LEV	0.246	2.89	-0.21	-3.41***
PROF	0.56	1.59**	0.036	2.94**
Constant	-28.71	-1.61	12.43	3.65**
R ² Overall		21.45		26.78
F-statistic		23.51**		31.56***
B-P LM test (χ^2)		485.21***		521.17***
Hausman test (χ^2)		31.87***		18.21***
White's test of Heteroscedasticity (χ^2)		137.86***		145.21***
Run-test for serial correlation (z-statistic)		-9.89***		-10.71***
DWH test of Endogeneity:				
Durbin (χ^2)		1.4598 ($p = 0.2168$)		1.3251 ($p = 0.1691$)
Wu-Hausman F-statistic		1.6471 ($p = 0.2713$)		1.2875 ($p = 0.2184$)

Note(s):

- (1) ***, ** and * indicate significant at 1, 5 and 10%, respectively
 - (2) Figures within parentheses indicate robust standard errors
 - (3) F-statistic: Goodness of fit
 - (4) Breusch and Pagan's (1980) Lagrange Multiplier (BP-LM) statistic (H_0 : Pooled OLS model is appropriate against the random effects model)
 - (5) White's test of Heteroscedasticity: (H_0 : Constant variance of the residuals)
 - (6) Run-test of serial correlation (H_0 : No serial correlation)
 - (7) Hausman (1978) specification test (χ^2) (H_0 : Fixed effect model is appropriate over random effects)
 - (8) Durbin-Wu-Hausman test of Endogeneity (H_0 : No endogeneity)
- Using CG_Score_2 and Tobin's Q as proxies of CG and FV, respectively

Table 8. Mediation of VD in CG FV relationship

indirect impact, hence VD can be said to have partial mediation impact on FV in terms of Tobin's Q as well. Moreover, to know the significance of indirect impact bootstrap test is undertaken, wherein the outcome reveals that the partial mediation impact is positive and significant with a bias-corrected 95% confidence intervals excluding zero (0.75, 0.41). As the direction of both direct as well indirect impact of CG on FV in terms of Tobin's Q are alike, this mediation can also be called as partial complementary mediation. Given the prevalence of direct impact in both the analysis, the significance of indirect impact provides partial support to H4. Hence, in view of the results obtained from the both the set of analysis, VD can be considered as a partial mediator in the relationship between CG and FV under different CG framework as well as diverse measurement of FV.

5. Conclusion

In view of the extant inconclusive and fragmented literature on the relationship between CG, VD and FV, I have made a modest attempt to examine the relationship between these three broad variables together in a single study for top Indian firms. The findings initially obtained by using overall CG score have significant positive impact on FV proxied by Ln_MCAP, whereas the same documents insignificant impact on Tobin's Q. Though VD exhibits significant positive impact on both the measures of FV, however, its interaction with overall CG unveils inconsistent findings as it documents positive contribution towards FV in terms of Ln_MCAP, while such interaction effect becomes insignificant on Tobin's Q. To untangle the reason for dissimilar findings, I have modified the CG measure by excluding the ownership structure variables like PROMO, GOV and FII and including only board- and audit-related variables to reveal the exclusive contribution of board-level governance toward FV without the involvement of substantial owners. However, I opt to use ownership structure variables separately in the analysis to reveal their standalone impact. The findings reveal a strong positive impact of CG represented by only board- and audit-related variables on both the measures of FV. In this regard, VD also exhibits a highly significant positive impact on FV. Interestingly, the interactive impact of CG and VD becomes highly significant on both the measures of FV. In addition, ownership structure variables like promoter's shareholdings and FII documents significant positive impact on FV, while government ownership report insignificant impact on the same. Further, the robustness test undertaken by using instrumental variables regression models also report similar findings.

Moreover, to know any causal relationship between the three board variables under consideration, the indirect relationship between CG and FV through the mediation of VD is investigated. The finding reveals that VD partially mediates the impact of overall CG on FV in terms of Ln_MCAP. Further to unveil the indirect impact of CG on FV through the mediation of VD, while FV is measured in terms of a relative measure, i.e. Tobin's Q, I have used the alternative measurement of CG wherein the outcome report that VD partially mediate the impact of board level governance on FV in terms of Tobin's Q. Specifically, my outcome suggests that CG apart from having a direct impact on FV also influences the same through the mediation VD. Furthermore, as the direction of indirect impact coincide with direct impact, such indirect impact has complementary relationship with the direct impact implying that when CG makes direct contribution towards improving FV, its contribution towards FV through mediation of VD also increases.

The study provides some important implications. First, though prior works on different board attributes provide mixed evidence on the performance impact of individual variables, the composite board-level measure of CG exhibits significant positive impact on both the measures of FV, which provides an indication of complementary/substitutive relationship of some board variables with the others. This implies that if a firm performs poor in some CG parameters, the negative effect of such poor performance can be offset by performing better

on some other parameters. Second, this study by showing the value contribution of overall CG measure and board structure, audit and ownership structure variables separately untangle the difference in contribution of CG when they work separately without the interference of substantial owners. Thus, it suggests the regulators as well as practitioners in Indian context that board's and auditor's autonomy should be maintained in order to reap the maximum benefits of having board as a control mechanism. Third, the outcome advocates that despite of prevailing exceptional characteristics of emerging market, VD is considered relevant by investors. This adds to the understanding of practitioners that disclosing information beyond the mandatory requirements signals investors about their superiority reduces the premium demanded by investors for bearing the information risk, thereby ultimately improving the market performance of firms. Third, in view of the theoretical as well as practical interrelation between CG and VD, this study provide primary evidence of positive interaction effect of CG and VD on FV, which suggests the regulators and practitioners that presence of both CG and VD simultaneously complements each other in making significant positive contribution toward FV. Fourth, departing from the common notion of direct relationship between CG and FV, this evidence of partial complementary mediation effect of VD also advocates CG regulators to give added emphasis on corporate transparency while making any alterations in the existing CG framework. Finally, this study significantly bridge the gap between theory and practice as it ratifies the prediction of some dominant theoretical perspectives in the concerned area like agency, positive accounting and signaling theory thereby indicate regulators, practitioners and other related parties that such theoretical assertions are not only applicable in letters practically prevails in context of an emerging market, i.e. India, but can also be adopted by any other emerging nations having similar institutional setting.

I also acknowledge some limitations of my study, which provides the pathway for future research. *First*, this study is based on annual reports as the source of information to capture VD. Although, disclosure made in regulated annual reports is the only source obtaining independently verified information about managers' performance on regular interval (Sloan, 2001), there is a scope for exploring other modes of disclosure like analyst presentations, press releases, prospectus, websites, etc. along with annual reports. *Second*, I have considered non-financial and non-utility firms only. Future studies can examine the relationship between CG, VD and FV in context of financial and utility firms in order to depict how such relationships work under the application of additional regulations like Banking Regulation Act, 1949 and Electricity Act, 2003. *Third*, this study paves the way for identifying some other contextual or governance-related variables as the possible mediator in the relationship between CG and FV. *Finally*, this study is confined to Indian firms only. A cross-country study with any other emerging economics can be made to provide deeper insight about the dynamics of CG, VD and FV.

Notes

1. Calculated as a percentage of market capitalization of sample firms by total market capitalization of BSE as on 31st March, 2014.
2. Extensive disclosure means comprehensive information in clear and precise terms. Mostly it is quantitative for financial items; and the amount of description (qualitative) for non-financial items such as corporate outlook, policy, strategy, etc. where quantification is not possible.
3. <https://www.stata.com/features/overview/endogenous-variables>

References

- Adams, R.B. and Ferreira, D. (2009), "Women in the boardroom and their impact on governance and performance", *Journal of Financial Economics*, Vol. 94 No. 2, pp. 291-309.

-
- Adams, M. and Hossain, M. (1998), "Managerial discretion and voluntary disclosure: empirical evidence from the New Zealand life insurance industry", *Journal of Accounting and Public Policy*, Vol. 17 No. 3, pp. 245-281.
- Adams, R. and Mehran, H. (2003), "Is corporate governance different for bank holding companies?", *Federal Reserve Bank of New York Economic Policy Review*, Vol. 9 No. 1, pp. 123-160.
- Akbar, S., Poletti-Hughes, J., El-Faitouri, R. and Shah, S.Z.A. (2016), "More on the relationship between corporate governance and firm performance in the UK: evidence from the application of generalized method of moments estimation", *Research in International Business and Finance*, Vol. 38 No. 1, pp. 417-429.
- Akhtar, G. (2013), "Inflows of FDI in India: pre and post reform period", *International Journal of Humanities and Social Science Invention*, Vol. 2 No. 2, pp. 01-11.
- Akhtaruddin, M. and Haron, H. (2010), "Board ownership, audit committees' effectiveness and corporate voluntary disclosures", *Asian Review of Accounting*, Vol. 18 No. 1, pp. 68-82.
- Akhtaruddin, M., Hossain, M.A., Hossain, M. and Yao, L. (2009), "Corporate governance and voluntary disclosure in corporate annual reports of Malaysian listed firms", *Journal of Applied Management Accounting Research*, Vol. 7 No. 1, pp. 1-20.
- Al-Akra, M. and Ali, M.J. (2012), "The value relevance of corporate voluntary disclosure in the Middle-East: the case of Jordan", *Journal of Accounting and Public Policy*, Vol. 31 No. 5, pp. 533-549.
- Albassam, W. (2014), "Corporate governance, voluntary disclosure and financial performance: an empirical analysis of Saudi listed firms using a mixed-methods research design", (Doctoral dissertation, University of Glasgow).
- Allegrini, M. and Greco, G. (2013), "Corporate boards, audit committees and voluntary disclosure: evidence from Italian listed companies", *Journal of Management and Governance*, Vol. 17 No. 1, pp. 187-216.
- Anam, O.A., Fatima, A.H. and Majdi, A.R.H. (2011), "Effects of intellectual capital information disclosed in annual reports on market capitalization", *Journal of Human Resource Costing and Accounting*, Vol. 15 No. 2, pp. 85-10.
- Arora, A. and Bodhanwala, S. (2018), "Relationship between corporate governance index and firm performance: Indian evidence", *Global Business Review*, Vol. 19 No. 3, pp. 675-689.
- Arora, A. and Sharma, C. (2016), "Corporate governance and firm performance in developing countries: evidence from India article information", *Corporate Governance International Journal of Business in Society*, Vol. 16 No. 2, pp. 420-436.
- Balasubramanian, B.N. and Anand, R.V. (2013), "Ownership trends in corporate India 2001-2011: evidence and implications", Indian Institute of Management Bangalore Working Paper No. 419, pp. 1-92.
- Balasubramanian, N., Black, B.S. and Khanna, V. (2010), "The relation between firm-level corporate governance and market value: a case study of India", *Emerging Markets Review*, Vol. 11 No. 4, pp. 319-340.
- Banghøj, J. and Plenborg, T. (2008), "Value relevance of voluntary disclosure in the annual report", *Accounting and Finance*, Vol. 48 No. 2, pp. 159-180.
- Barako, D.G., Hancock, P. and Izan, H.Y. (2006), "Factors influencing voluntary corporate disclosure by Kenyan companies", *Corporate Governance: An International Review*, Vol. 14 No. 2, pp. 107-125.
- Baron, R.M. and Kenny, D.A. (1986), "The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations", *Journal of Personality and Social Psychology*, Vol. 51 No. 6, pp. 11-73.
- Bauer, R., Frijns, B., Otten, R. and Tourani-Rad, A. (2008), "The impact of corporate governance on corporate performance: evidence from Japan", *Pacific-Basin Finance Journal*, Vol. 16 No. 3, pp. 236-251.

- Botosan, C.A. (1997), "Disclosure level and the cost of equity capital", *Accounting Review*, Vol. 72 No. 3, pp. 323-349.
- Botosan, C.A. and Plumlee, M.A. (2002), "A re-examination of disclosure level and the expected cost of equity capital", *Journal of Accounting Research*, Vol. 40 No. 1, pp. 21-40.
- Bozec, R., Dia, M. and Bozec, Y. (2010), "Governance-performance relationship: a re-examination using technical efficiency measures", *British Journal of Management*, Vol. 21 No. 3, pp. 684-700.
- Breusch, T.S. and Pagan, A.R. (1980), "The Lagrange multiplier test and its applications to model specification in econometrics", *The Review of Economic Studies*, Vol. 47 No. 1, pp. 239-253.
- Brockman, P., Martin, X. and Puckett, A. (2010), "Voluntary disclosures and the exercise of CEO stock options", *Journal of Corporate Finance*, Vol. 16 No. 1, pp. 120-136.
- Brown, L.D. and Caylor, M.L. (2006), "Corporate governance and firm valuation", *Journal of Accounting and Public Policy*, Vol. 25 No. 4, pp. 409-434.
- Cahan, S.F., De Villiers, C., Jeter, D.C., Naiker, V. and Van Staden, C.J. (2016), "Are CSR disclosures value relevant? Cross-country evidence", *European Accounting Review*, Vol. 25 No. 3, pp. 579-611.
- Campbell, D., Shrivies, P. and Bohmbach-Saager, H. (2001), "Voluntary disclosure of mission statements in corporate annual reports: signaling what and to whom?", *Business and Society Review*, Vol. 106 No. 1, pp. 65-87.
- Charumathi, B. and Ramesh, L. (2015), "On the determinants of voluntary disclosure by Indian companies", *Asia-Pacific Journal of Management Research and Innovation*, Vol. 11 No. 2, pp. 108-116.
- Chatterjee, D. and Bose, S.K. (2007), "Corporate governance, risk management and internal audit: a case study", *Management and Labour Studies*, Vol. 32 No. 4, pp. 515-521.
- Chen, A., Kao, L., Tsao, M. and Wu, C. (2007), "Building a corporate governance index from the perspectives of ownership and leadership for firms in Taiwan", *Corporate Governance*, Vol. 15, pp. 251-261.
- Cheung, Y.L., Thomas Connelly, J., Limpaphayom, P. and Zhou, L. (2007), "Do investors really value corporate governance? Evidence from the Hong Kong market", *Journal of International Financial Management and Accounting*, Vol. 18 No. 2, pp. 86-122.
- Chmelarova, V. and Hill, R.C. (2010), "The Hausman pretest estimator", *Economics Letters*, Vol. 108 No. 1, pp. 96-99.
- Clarkson, P.M., Fang, X., Li, Y. and Richardson, G. (2013), "The relevance of environmental disclosures: are such disclosures incrementally informative?", *Journal of Accounting and Public Policy*, Vol. 32 No. 5, pp. 410-431.
- Companies Act (2013), available at: <https://www.mca.gov.in/Ministry/pdf/CompaniesAct2013.pdf>
- Cormier, D., Magnan, M. and Van Velthoven, B. (2005), "Environmental disclosure quality in large German companies: economic incentives, public pressures or institutional conditions?", *European Accounting Review*, Vol. 14 No. 11, pp. 3-39.
- Craswell, A.T. and Taylor, S.L. (1992), "Discretionary disclosure of reserves by oil and gas companies: an economic analysis", *Journal of Business Finance and Accounting*, Vol. 19 No. 2, pp. 295-308.
- Cronbach, L.J. (1951), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16 No. 3, pp. 297-334.
- Darrrough, M.N. and Stoughton, N.M. (1990), "Financial disclosure policy in an entry game", *Journal of Accounting and Economics*, Vol. 12 Nos 1-3, pp. 219-243.
- Dawd, I. and Charfeddine, L. (2019), "Effect of aggregate, mandatory and voluntary disclosure on firm performance in a developing market: the case of Kuwait", *International Journal of Accounting, Auditing and Performance Evaluation*, Vol. 15 No. 1, pp. 31-56.

-
- Dhaliwal, D., Li, O.Z., Tsang, A. and Yang, Y.G. (2014), "Corporate social responsibility disclosure and the cost of equity capital: the roles of stakeholder orientation and financial transparency", *Journal of Accounting and Public Policy*, Vol. 33 No. 4, pp. 328-355.
- Dharwadkar, R., George, G. and Brandes, P. (2000), "Privatization in emerging economies: an agency theory perspective", *Academy of Management Review*, Vol. 25 No. 3, pp. 650-669.
- Diamond, D.W. and Verrecchia, R.E. (1991), "Disclosure, liquidity, and the cost of capital", *The Journal of Finance*, Vol. 46 No. 4, pp. 1325-1359.
- Donnelly, R. and Mulcahy, M. (2008), "Board structure, ownership, and voluntary disclosure in Ireland", *Corporate Governance: An International Review*, Vol. 16 No. 5, pp. 416-429.
- Dwivedi, N. and Jain, A.K. (2005), "Corporate governance and performance of Indian firms: the effect of board size and ownership", *Employee Responsibilities and Rights Journal*, Vol. 17 No. 3, pp. 161-172.
- Dyck, A. and Zingales, L. (2004), "Private benefits of control: an international comparison", *Journal of Finance*, Vol. 59 No. 2, pp. 537-600.
- Dye, R.A. (1986), "Proprietary and nonproprietary disclosures", *The Journal of Business*, Vol. 59 No. 2, pp. 331-366.
- Education World (2018), "10 corruption scandals that shook the nation", *Education World Website*, available at: <https://www.educationworld.in/10-corruption-scandals-that-shook-the-nation> (accessed 19 June 2021).
- Embretson, S.E. (2007), "Construct validity: a universal validity system or just another test evaluation procedure?", *Educational Researcher*, Vol. 36 No. 8, pp. 449-455.
- Enache, L. and Hussainey, K. (2020), "The substitutive relation between voluntary disclosure and corporate governance in their effects on firm performance", *Review of Quantitative Finance and Accounting*, Vol. 54 No. 2, pp. 413-445.
- Eng, L.L. and Mak, Y.T. (2003), "Corporate governance and voluntary disclosure", *Journal of Accounting and Public Policy*, Vol. 22 No. 4, pp. 325-345.
- Fama, E.F. and Jensen, M.C. (1983), "Separation of ownership and control", *Journal of Law and Economics*, Vol. 26 No. 2, pp. 301-325.
- Francis, J. and Schipper, K. (1999), "Have financial statements lost their relevance?", *Journal of Accounting Research*, Vol. 37 No. 2, pp. 319-352.
- Ganguli, S.K. and Guha Deb, S. (2016), "Board composition, ownership structure and firm performance: new Indian evidence in a unique regulatory environment", *SSRN Electronic Journal*. doi: [10.2139/ssrn.2746773](https://doi.org/10.2139/ssrn.2746773).
- Garg, A.K. (2007), "Influence of board size and independence on firm performance: a study of Indian companies", *Vikalpa*, Vol. 32 No. 3, pp. 39-60.
- Ghazali, N.A.M. (2007), "Ownership structure and corporate social responsibility disclosure: some Malaysian evidence", *Corporate Governance: The International Journal of Business in Society*, Vol. 7 No. 3, pp. 251-266.
- Gisbert, A., Navallas, B. and Romero, D. (2014), "Proprietary costs, governance and the segment disclosure decision", *Journal of Management and Governance*, Vol. 18 No. 3, pp. 733-763.
- Goel, P. and Ramesh, R.S. (2016), "Impact of corporate governance practices on firm profitability: a study of selected industries in India", *Journal of Finance, Accounting and Management*, Vol. 7 No. 2, pp. 53-74.
- Goh, B.W., Lee, J., Ng, J. and Ow Yong, K. (2016), "The effect of board independence on information asymmetry", *European Accounting Review*, Vol. 25 No. 1, pp. 155-182.
- Gompers, P., Ishii, J. and Metrick, A. (2003), "Corporate governance and equity prices", *The Quarterly Journal of Economics*, Vol. 118 No. 1, pp. 107-156.

-
- Gray, R., Kouhy, R. and Lavers, S. (1995), "Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure", *Accounting, Auditing, and Accountability Journal*, Vol. 8 No. 2, pp. 47-77.
- Green, W. (2003), *Econometric Analysis*, Pearson Education, Singapore.
- Gujarati, D. (2003), *Basic Econometrics*, 4th ed., McGraw-Hill, New York.
- Gul, F.A. and Leung, S. (2004), "Board leadership, outside directors' expertise and voluntary corporate disclosures", *Journal of Accounting and Public Policy*, Vol. 23 No. 5, pp. 351-379.
- Hail, L. (2002), "The impact of voluntary corporate disclosures on the ex-ante cost of capital for Swiss firms", *European Accounting Review*, Vol. 11 No. 4, pp. 741-773.
- Hassan, O.A. and Marston, C. (2010), *Disclosure Measurement in the Empirical Accounting Literature: A Review Article*, Brunel University, London.
- Hassan, O.A., Romilly, P., Giorgioni, G. and Power, D. (2009), "The value relevance of disclosure: evidence from the emerging capital market of Egypt", *The International Journal of Accounting*, Vol. 44 No. 1, pp. 79-102.
- Hausman, J.A. (1978), "Specification tests in econometrics", *Econometrica: Journal of the Econometric Society*, Vol. 46 No. 6, pp. 1251-1271.
- Healy, P.M. and Palepu, K.G. (2001), "Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature", *Journal of Accounting and Economics*, Vol. 31 Nos 1-3, pp. 405-440.
- Hillman, A.J. and Dalziel, T. (2003), "Boards of directors and firm performance: integrating agency and resource dependence perspectives", *Academy of Management Review*, Vol. 28 No. 3, pp. 383-396.
- Ho, P.L. and Taylor, G. (2013), "Corporate governance and different types of voluntary disclosure: evidence from Malaysian listed firms", *Pacific Accounting Review*, Vol. 25 No. 1, pp. 4-29.
- Huafang, X. and Jianguo, Y. (2007), "Ownership structure, board composition and corporate voluntary disclosure: evidence from listed companies in China", *Managerial Auditing Journal*, Vol. 22 No. 6, pp. 604-619.
- Hussainey, K. and Wang, M. (2010), "Voluntary disclosure and corporate governance: further UK evidence", Stirling University Working paper.
- Jackling, B. and Johl, S. (2009), "Board structure and firm performance: evidence from India's top companies", *Corporate Governance: An International Review*, Vol. 17 No. 4, pp. 492-509.
- Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.
- Kao, M.F., Hodgkinson, L. and Jaafar, A. (2019), "Ownership structure, board of directors and firm performance: evidence from Taiwan", *Corporate Governance*, Vol. 19 No. 1, pp. 189-216.
- Kaur, S., Raman, V.A. and Singhania, M. (2016), "Impact of corporate characteristics on human resource disclosures", *Asian Review of Accounting*, Vol. 24 No. 4, pp. 390-425.
- Kim, O. and Verrecchia, R.E. (1994), "Market liquidity and volume around earnings announcements", *Journal of Accounting and Economics*, Vol. 17 Nos 1-2, pp. 41-67.
- Klein, P., Shapiro, D. and Young, J. (2005), "Corporate governance, family ownership and firm value: the Canadian evidence", *Corporate Governance: An International Review*, Vol. 13 No. 6, pp. 769-784.
- Laskar, N. and Maji, S.G. (2018), "Disclosure of corporate sustainability performance and firm performance in Asia", *Asian Review of Accounting*, Vol. 26 No. 4, pp. 414-443.
- Lim, S., Matolcsy, Z. and Chow, D. (2007), "The association between board composition and different types of voluntary disclosure", *European Accounting Review*, Vol. 16 No. 3, pp. 555-583.
- Lucas-Pérez, M.E., Mínguez-Vera, A., Baixauli-Soler, J.S., Martín-Ugedo, J.F. and Sánchez-Marín, G. (2015), "Women on the board and managers' pay: evidence from Spain", *Journal of Business Ethics*, Vol. 129 No. 1, pp. 265-280.

-
- Luo, S., Courtenay, S.M. and Hossain, M. (2006), "The effect of voluntary disclosure, ownership structure and proprietary cost on the return–future earnings relation", *Pacific-Basin Finance Journal*, Vol. 14 No. 5, pp. 501-521.
- Meeke, G.K., Roberts, C.B. and Gray, S.J. (1995), "Factors influencing voluntary annual report disclosures by U.S., U. K. and continental European multinational corporations", *Journal of International Business Studies*, Vol. 26 No. 3, pp. 555-572.
- Michelon, G. and Parbonetti, A. (2012), "The effect of corporate governance on sustainability disclosure", *Journal of Management and Governance*, Vol. 16 No. 3, pp. 477-509.
- Nag, T. and Bhattacharyya, A.K. (2016), "Corporate social responsibility reporting in India: exploring linkages with firm performance", *Global Business Review*, Vol. 17 No. 6, pp. 1427-1440.
- Naseem, M.A., Lin, J., Rehman, R.U., Ahmad, M.I. and Ali, R. (2019), "Moderating role of financial ratios in corporate social responsibility disclosure and firm value", *Plosone*, Vol. 14 No. 4, e0215430.
- OECD (2009), *Corporate Governance and the Financial Crisis: Key Findings and Main Messages*, OECD Publishing, Paris.
- OECD (2015), *G20/OECD Principles of Corporate Governance*, OECD Publishing, Paris.
- Omran, M.A. and El-Galfy, A.M. (2014), "Theoretical perspectives on corporate disclosure: a critical evaluation and literature survey", *Asian Review of Accounting*, Vol. 22 No. 3, pp. 257-286.
- Parum, E. (2005), "Does disclosure on corporate governance lead to openness and transparency in how companies are managed?", *Corporate Governance: An International Review*, Vol. 13 No. 5, pp. 702-709.
- Patelli, L. and Prencipe, A. (2007), "The relationship between voluntary disclosure and independent directors in the presence of a dominant shareholder", *European Accounting Review*, Vol. 16 No. 1, pp. 5-33.
- Plumlee, M., Brown, D., Hayes, R.M. and Marshall, R.S. (2015), "Voluntary environmental disclosure quality and firm value: further evidence", *Journal of Accounting and Public Policy*, Vol. 34 No. 4, pp. 336-361.
- Preacher, K.J. and Hayes, A.F. (2008), "Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models", *Behavior Research Methods*, Vol. 40 No. 3, pp. 879-891.
- Price, R., Román, F.J. and Rountree, B. (2011), "The impact of governance reform on performance and transparency", *Journal of Financial Economics*, Vol. 99 No. 1, pp. 76-96.
- Raithatha, M. and Bapat, V. (2012), "Corporate governance compliance practices of Indian companies", *Corporate Governance*, Vol. 3 No. 8, pp. 19-26.
- Rashid, M.M. (2020), "Ownership structure and firm performance :the mediating role of board characteristics", *Corporate Governance: The International Journal of Business in Society*, Vol. 20 No. 4, pp. 719-737.
- Roe, M. (2004), "The institutions of corporate governance", Discussion Paper No. 488, Harvard Law School.
- Rouf, A. (2011), "Corporate characteristics, governance attributes and the extent of voluntary disclosure in Bangladesh", *African Journal of Business Management*, Vol. 5 No. 19, pp. 7836-7845.
- Roy, A. (2016), "Corporate governance and firm performance: a study of Indian listed firms", *Metamorphosis*, Vol. 15 No. 1, pp. 31-46.
- Saha, R. and Kabra, K.C. (2019), "The value relevance of corporate voluntary disclosure: evidence from India", *IUP Journal of Accounting Research and Audit Practices*, Vol. 18 No. 3, pp. 7-27.
- Saha, R. and Kabra, K.C. (2021), "Corporate governance and voluntary disclosure: evidence from India", *Journal of Financial Reporting and Accounting*, Vol. 20 No. 1, pp. 127-160.

- Said, R., Zainuddin, Y.H. and Haron, H. (2009), "The relationship between corporate social responsibility disclosure and corporate governance characteristics in Malaysian public listed companies", *Social Responsibility Journal*, Vol. 5 No. 2, pp. 212-226.
- Sarkar, J. (2009), "Board independence and corporate governance in India: recent trends and challenges ahead", *Indian Journal of Industrial Relations*, Vol. 44 No. 4, pp. 576-592.
- Schubert, R. (2006), "Analyzing and managing risks – on the importance of gender differences in risk attitudes", *Managerial Finance*, Vol. 32 No. 9, pp. 706-715.
- Shahwan, T.M. and Fathalla, M.M. (2020), "The mediating role of intellectual capital in corporate governance and the corporate performance relationship", *International Journal of Ethics and Systems*, Vol. 36 No. 4, pp. 531-561.
- Sheikh, N.A., Wang, Z. and Khan, S. (2013), "The impact of internal attributes of corporate governance on firm performance: evidence from Pakistan", *International Journal of Commerce and Management*, Vol. 23 No. 1, pp. 38-55.
- Sheko, A. and Braimllari, A. (2018), "Information technology inhibitors and information quality in supply chain management: a PLS-SEM analysis", *Academic Journal of Interdisciplinary Studies*, Vol. 7 No. 3, p. 125.
- Shivdasani, A. and Yermack, D. (1999), "CEO involvement in the selection of new board members: an empirical analysis", *Journal of Finance*, Vol. 54 No. 5, pp. 1829-1853.
- Shleifer, A. and Vishny, R.W. (1997), "A survey of corporate governance", *The Journal of Finance*, Vol. 52 No. 2, pp. 737-783.
- Singh, D.A. and Gaur, A.S. (2009), "Business group affiliation, firm governance, and firm performance: evidence from China and India", *Corporate Governance: An International Review*, Vol. 17 No. 4, pp. 411-425.
- Sloan, R.G. (2001), "Financial accounting and corporate governance: a discussion", *Journal of Accounting and Economics*, Vol. 32 No. 3, pp. 335-347.
- Smriti, N. and Das, N. (2018), "The impact of intellectual capital on firm performance: a study of Indian firms listed in COSPI", *Journal of Intellectual Capital*, Vol. 19 No. 5, pp. 935-964.
- Uyar, A. and Kılıç, M. (2012), "Value relevance of voluntary disclosure: evidence from Turkish firms", *Journal of Intellectual Capital*, Vol. 13 No. 3, pp. 363-376.
- Vafeas, N. (1999), "Board meeting frequency and firm performance", *Journal of Financial Economics*, Vol. 53 No. 1, pp. 113-142.
- Verrecchia, R.E. (1990), "Information quality and discretionary disclosure", *Journal of Accounting and Economics*, Vol. 12 No. 4, pp. 365-380.
- Wallace, R.S.O. and Naser, K. (1995), "Firm-specific determinants of the comprehensiveness of mandatory disclosure in the corporate annual reports of firms listed on the stock exchange of Hong Kong", *Journal of Accounting and Public Policy*, Vol. 14 No. 4, pp. 311-368.
- Wang, K., Sewon, O. and Claiborne, M.C. (2008), "Determinants and consequences of voluntary disclosure in an emerging market: evidence from China", *Journal of International Accounting, Auditing and Taxation*, Vol. 17 No. 1, pp. 14-30.
- Wolfe, J. and Sauaia, A.C.A. (2014), "The Tobin q as a company performance indicator", in *Developments in Business Simulation and Experiential Learning*, Proceedings of the Annual ABSEL Conference, Vol. 30, pp. 155-159.
- Zhao, X., Lynch, J.G. Jr and Chen, Q. (2010), "Reconsidering Baron and Kenny: myths and truths about mediation analysis", *Journal of Consumer Research*, Vol. 37 No. 2, pp. 197-206.

(The Appendix follows overleaf)

A. Corporate and strategic disclosure index (CSDI)

1. Brief history of the company (0-2)
2. Organization structure (0-2)
3. Corporate Mission and vision (0-2)
4. Objectives (0-2)
5. Description of marketing network for finished goods (0-2)
6. Physical output and capacity utilization (0-2)
7. Strategy—General (0-2)
8. Strategy—Financial (0-2)
9. Strategy—Marketing (0-2)
10. Strategy—Social (0-2)
11. Strategy—HR (0-2)
12. Impact of strategy on current results (0-2)
13. Impact of strategy on future results (0-2)
14. Multi language presentation (0-2)
15. Actions taken during the year to achieve the corporate goals (0-2)
16. Actions to be taken in the future year discussed (0-2)
17. Discussion about major regional economic development (0-2)
18. Reasons for Acquisitions (0-2)
19. Reasons for disposals (0-2)
20. Future capital expenditure (0-2)

B. Forward-Looking Disclosure Index (FWLDI)

21. Forecast of cash flow (0-2)
22. Forecast of profits (0-2)
23. Forecast of sales (0-2)
24. Forecast of market share (0-2)
25. Assumptions underlying the forecast (0-2)
26. Expected rate of return on project (0-2)
27. Order book or backlog information (0-2)
28. Political influences on future profit (0-2)
29. Economical influences on future profit (0-2)
30. Technological influences on future profit (0-2)

C. Human and Intellectual Capital Disclosure (HICDI)

31. Geographical distribution of employees (0-2)
32. Line of business distribution of employees (0-2)
33. Number of employees for two or more years (0-2)
34. Reason for changes in the employees numbers or categories (0-2)
35. Redundancy information (0-2)
36. Recruitment policy (0-2)
37. Marketing innovation (0-2)
38. Value of customer relationship (0-2)
39. No. of employees engaged in R&D (0-2)
40. R&D focus areas (0-2)
41. Discussion of new product development (0-2)
42. Forecast of R&D expenditure (0-2)
43. Human resources accounting (0-2)
44. Valued added statement (0-2)

D. CG Disclosure (CGDI)

45. Reimbursement of maintenance expenses by non-executive chairperson (0-1)
46. Interim financial report sent to each household of shareholders (0-1)
47. Separate position for CEO and chairman (0-1)
48. Unmodified audit opinion with declaration (0-1)
49. Reporting by internal auditor directly to the audit committee (0-1)

Table A1.
List of items included
in voluntary
disclosure index

(continued)

E. Financial and Capital Market Disclosure (FCMDI)

- 50. Cash flow ratio (0-2)
- 51. Disclosure of intangible asset valuations (except goodwill and brands) (0-2)
- 52. Index of selling price (0-2)
- 53. Advertisement information- Qualitative (0-2)
- 54. Financial history of 5 years or more (0-2)
- 55. Effect of inflation on assets (0-2)
- 56. Effects of inflation on profits (0-2)
- 57. Inflation-adjusted financial statements (0-1)
- 58. Effects of fluctuating interest rate on results (0-2)
- 59. Cost of capital (0-2)
- 60. Economic value added (0-2)
- 61. Fund flow statement (0-2)
- 62. Bankers' details (0-1)
- 63. Transfer Pricing Policy (0-2)
- 64. Market capitalization trend (0-2)
- 65. Share price trend (0-2)
- 66. Volume of shares traded (0-2)
- 67. Effects of foreign currency fluctuations on future operations (0-2)
- 68. Foreign currency exposure management description (0-2)
- 69. Debt currency (0-1)

Table A1.

Corresponding author

Rupjyoti Saha can be contacted at: rupjyoti.1122@rediffmail.com

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com