Corporate Governance and Risk Reporting in South Africa: A Study of Corporate Risk Disclosures in the Pre- and Post-2007/2008 Global Financial Crisis Period

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Abstract

The 2007/2008 global financial crisis has reignited the debate regarding the need for effective corporate governance (CG) through sound risk management and reporting practices. This paper, therefore, examines the crucial question of whether the quality of firm-level CG has any effect on the quality and extent of corporate risk disclosures (CRD) in South Africa (SA) with particular focus on the pre- and post-2007/2008 global financial crisis period. Using one of the largest datasets to-date on CG and CRD, from 2002 to 2011, and distinctively drawing on a multiple theoretical perspective, we find that CRD are largely 'non-financial', 'historical', 'good news' and 'qualitative' in nature over the ten-year period investigated. We also find that block ownership and institutional ownership are negatively associated with the extent of CRD, whilst board diversity, board size and independent non-executive directors are positively related to the extent of CRD. By contrast, dual board leadership structure has no significant connection with the extent of CRD. Our results are robust across a raft of econometric models that adequately address different types of endogeneity problems, as well as alternative CG and CRD proxies. Our findings are largely consistent with the predictions of our multi-theoretical framework that incorporates insights from agency, legitimacy, institutional, resource-dependence, and stakeholder theories.

Keywords: Corporate governance, Risk management and reporting, Multiple theoretical perspectives, 2007/2008 global financial crisis, King reports and South Africa

JEL classification: G20, G32, G34, G38

1. Introduction

Major corporate collapses in the 1990s/2000s, particularly in the developed economies of Western Europe and North America, highlighted the need for good corporate governance (CG) through greater corporate accountability, social responsibility, sound risk management, transparency and disclosure practices (King Committee, 1994, 2002; Mallin, 2002; Iatridis, 2010). The 2007/2008 global financial crisis has reignited the debate and, in particular, the effectiveness of corporate risk management and disclosure practices (Walker Review, 2009; Breitenfellner & Wagner, 2010; Iatridis, 2008, 2011). This paper, therefore, investigates the association between CG and risk reporting in the light of the 2007/2008 global financial crisis. Specifically, we utilise a natural and unique corporate setting in South Africa (SA), where recent CG disclosure policy reforms distinctively require corporations to provide more transparent information on a set of recommended good risk management practices to examine the motives for, and determinants of, corporate risk disclosures (CRD).

The past years have witnessed a surge of interest in the quality and extent of corporate risk practices (ASB, 2009; ICAEW, 2011). This development is not only caused by the increased multi-level pressure from various external and internal corporate stakeholders, including regulators and investors (Berger & Gleibner, 2006; Linsley & Shrives, 2006), but is also due to the apparent strategic implications for maintaining long-term sustainable corporate operations (Abraham & Cox, 2007; Bhimani, 2009).[1] In fact, as risk disclosure involves substantial costs relating to litigation, copyrights, competition, regulation and taxation (Lajili & Zeghal, 2005; Greco, 2012), it has been argued that in the absence of potential direct and indirect benefits rational managers will not voluntarily engage in CRD (Beretta & Bozzolan, 2004; Lopes & Rodrigues, 2007). Hence, within this perspective, managers may engage in comprehensive CRD for a number of strategic motives/reasons.

First, increased commitment to transparency and accountability through CRD can minimise agency problems (Schrand, 1997; Rajgopal, 1999; Holm & Laursen, 2007) by reducing information asymmetry between managers and corporate stakeholders (Jensen & Meckling, 1976; Rhodes & Soobaroyen, 2010), and thereby enhance performance. Second, from institutional (DiMaggio & Powell, 1983; Scott, 1987) and legitimacy (Ashforth & Gibbs, 1990; Suchman, 1995) theories' perspective, engaging in greater transparency and disclosure practices through CRD can strategically enhance congruence of corporate goals and norms with those of society, which can facilitate sustainable corporate operations by improving corporate reputation and goodwill (King

[1]Indeed, widespread public perceptions and limited anecdotal evidence suggest that poor risk management and CRD practices partly contributed to the 2007/2008 financial crisis (the so called "credit crunch") (SSG, 2009; Walker Review, 2009; Breitenfellner & Wagner, 2010; Pirson & Turnbull, 2011).

Committee, 1994, 2002). Third, stakeholder theory suggests that engaging in comprehensive CRD (Holm & Laursen, 2007; Amran et al., 2009; Elzahar & Hussainey, 2012) can be an effective strategy to gain the support of influential corporate stakeholders, such as regulators, investors, government and employees (Freeman & Reed, 1983; Freeman, 1984; Donaldson & Preston, 1995), who may be important to a corporation's ability to conduct economically viable operations (King Committee, 1994, 2002). Fourth, from a resource-dependence perspective, increased commitment to CRD (Oliveira et al., 2011; Pirson & Turnbull, 2011) can increase access to crucial resources, such as finance, by minimising capital and political costs through improved corporate image and reputation (Pfeffer & Salancik, 1978; Branco & Rodrigues, 2006). In short, greater commitment to transparent CRD practices could have significant investment (capital budgeting), financing (capital structure) and liquidity (working capital) implications by reducing agency and information asymmetry problems (Botosan, 1997; Beretta & Bozzolan, 2004; Cabedo & Tirado, 2004; Abraham & Cox, 2007; Brown et al., 2009).

While a number of prior studies have focused on the drivers of, and reasons for, the occurrence and extent of CRD (Meier et al., 1995; Solomon et al., 2000; Ahmed et al., 2004), they appear to suffer from a number of limitations. First, existing studies have mainly examined how general firm characteristics, such as size and industry, drive CRD (Schrand & Elliott, 1998; Lajili & Zeghal, 2005; Berger & Gleibner, 2006; Raj & Handley-Schachler, 2009). By contrast, and despite suggestions that corporate disclosure decisions, including CRD, are largely at the discretion of corporate owners and boards (Beretta & Bozzolan, 2004; Michelon & Parbonetti, 2012), studies investigating how a company's CG mechanisms may affect its CRD are generally scarce (Abraham & Cox, 2007; Oliveira et al., 2011; Elzahar & Hussainey, 2012), and particularly so in developing countries (West, 2000; Amran et al., 2009). This considerably limits our understanding of why and how CG mechanisms might promote or impede CRD. Second, most prior studies have focused narrowly on financial CRD, especially market risks (i.e., exchange/interest rates, and commodity/equity prices), financial derivatives/instruments, and credit risks (i.e., credit default) (Schrand, 1997; Schrand & Elliott, 1998; Rajgopal, 1999; Marshall & Weetman, 2008). In contrast, studies exploring non-financial CRD, such as business/operational and strategic risks, are generally rare (Beretta & Bozzolan, 2004; Linsley et al., 2006; Brown et al., 2009).[2] Third, existing CRD studies have mainly employed one year cross-sectional data (Linsley & Shrives, 2006; Abraham & Cox, 2007; Lopes & Rodrigues, 2007; Oliveira et

[2]This is partly due to the general lack of a comprehensive CRD framework (Cabedo & Tirado, 2004; Abraham & Cox, 2007), broadly reflecting the piecemeal/patchy approach to regulating CRD by the various national and international regulatory and professional accounting bodies, such as the International Accounting Standards Board, Securities and Exchange Commission, and EU (ICAEW, 2011; Linsley, 2011), nevertheless, it inevitably limits our understanding of the determinants of, and motivations for, CRD.

al., 2011), with limited longitudinal analyses (Berger & Gleibner, 2006; Raj & Handley-Schachler, 2009; Greco, 2012), and thereby limiting our understanding of CRD behaviour over time. Crucially, there is a growing criticism regarding inadequate empirical evidence, and a general lack of critical academic reflections, on CRD in the period leading to, during, and after the 2007/2008 global financial crisis (Edkins, 2009; ASB, 2009; ICAEW, 2011; Linsley, 2011; Abraham et al., 2012). Finally, and despite the increasing evidence that employing a multiple theoretical framework provides a richer basis for understanding and explaining corporate disclosures, including CRD (Branco & Rodrigues, 2008; Chen & Roberts, 2010; Oliveira et al., 2011), past studies are either ex-ante relying primarily on a single theoretical perspective (Amran et al., 2009; Edkins, 2009; Elzahar & Hussainey, 2012) or are predominantly descriptive in nature (Meier et al., 1995; Marshall & Weetman, 2008; ASB, 2009).

Given this background, this study attempts to overcome the limitations of existing studies in a number of ways, and thereby extend, as well as make a number of new contributions to the extant CG and CRD literature. First, we seek to specifically examine the extent to which a company's CG mechanisms (i.e., in terms of ownership and board characteristics) may affect its CRD. This departs from most past studies that investigate how general company features, such as size and industry influence CRD. Our contention is that in a competitive and information asymmetric market, whereby CRD have significant financial and non-financial costs implications, better-governed corporations need to distinguish themselves by credibly signalling their good governance, accountability and transparency qualities. One way by which better-governed corporations can distinguish themselves is to commit to higher levels of CRD (Mallin, 2002; Beekes & Brown, 2006). Second, and unlike existing one year cross-sectional studies, our study explores CRD over a long and recent period (i.e., from 2002 to 2011), and thereby allows us to distinctively shed crucial and timely empirical insights on CRD in the pre- and post-2007/2008 global financial crisis period. Third, and distinct from most of the existing studies that have narrowly investigated financial CRD, we provide evidence regarding both financial and non-financial CRD. Finally, we examine the drivers of CRD from multiple theoretical perspectives. Given the different motivations for CRD (Amran et al., 2009; Oliveira et al., 2011), the study is distinguished from previous studies by its ex-ante exploration of a number of theoretical perspectives, including agency, institutional, legitimacy, resource-dependence and stakeholder theories, as providing the likely basis for understanding and explaining CRD in the particular context of SA.

As will be discussed further, SA provides an interesting and natural context where CRD can be studied. Following the collapse of apartheid in 1994, and similar to other Anglo-American countries, SA has pursued CG policy reforms in the form of the King Reports (King Committee, 1994, 2002). Distinct from other Anglo-Saxon

countries, however, the reforms require firms to provide more transparent information on a set of recommended good risk management practices (Ntim et al., 2011, 2012). As such, our study context, allows us to explicitly investigate whether a company's CG structures affect its CRD practices, as well as the various motives that may influence such disclosures.

The remainder of the paper is organised as follows. The next section discusses CG and the risk reporting policy reforms pursued in SA. The following sections present a multi-theoretical framework for corporate risk disclosures, discuss the CG and CRD literature, outline our research design, and present the empirical analyses, with the concluding remarks containing a summary and a brief discussion of policy implications.

2. Corporate governance, risk reporting and the South African corporate context

A considerable number of global corporate failures in the 1990s/2000s emphasised the relevance of good CG, accountability, risk management, social responsibility, accounting transparency and disclosure practices (King Committee, 1994, 2002; Mallin, 2002). Consequently, CG policy reforms have been pursued in a large number of countries (see Aguilera & Cuervo-Cazurra, 2009). It may be observed that such CG reforms, especially those implemented in Anglo-Saxon countries have predominantly focused narrowly on financial aspects (Ntim et al., 2011, 2012). However, CG reforms carried out in SA have explicitly focused broadly on both financial and non-financial aspects of CG, including risk management and reporting (Ntim et al., 2011). Arguably, this creates a natural and unique context, whereby the connection between CG and CRD can be investigated.

Formal attempts at enhancing CG practices in SA corporations began in 1994 with the King I report, but while the proposals were observably similar to those of other Anglo-American countries, the report distinctively focused on both financial (shareholder) and non-financial (stakeholder) aspects, particularly regarding the environment, health, safety and affirmative action (Ntim et al., 2011, 2012). However, and crucially, King I failed to explicitly make recommendations relating to sound corporate risk management and reporting practices (King Committee, 1994, 2002). Consequently, King I was revised and replaced with a second King Report (King II) in 2002. Similar to King I, King II focused on governing the firm in the broader interests of both shareholders and stakeholders, but distinct from King I, it placed special emphasis on the need for sound and robust risk management and reporting practices (King Committee, 2002; Ntim, et al., 2012). Specifically, it provided explicit guidance in three main areas of risk management: definition, identification, and classification of risks; risk governance structure; and application and risk reporting.

In terms of risk definition, King II defined risk as "*uncertain future events that could influence the achievement of a company's objectives*" (King Committee, 2002, p.30)[3], and broadly classified risks into financial and non-financial (see Appendix 1). Financial risk is defined generally as possible losses in the financial markets, which are largely internal and monetary in nature with direct and immediate effects on corporate assets and liabilities on the balance sheet. More precisely, these include: market risk arising from adverse changes in interest/exchange rates; and commodity/equity prices; as well as financial instruments/derivatives; credit/default risk; liquidity risk; and capital adequacy/insolvency risk. By contrast, non-financial risks are external and non-monetary in nature involving indirect and longer-term effects on corporate assets and liabilities. In this respect, King II identified two main types of non-financial risks: (i) *business/operational*, referring to internal day-to-day decisions and risks that a company willingly assumes in order to create a competitive advantage and generate value for shareholders, including those relating to compliance, goodwill/reputation and legal aspects, amongst others; and (ii) *strategic*, referring to risks arising from basic changes in the external macro-economic environment, including GDP, inflation rate, money supply, as well as natural disasters, amongst others (see Appendix 1 for the full list).

With particular respect to risk governance, King II indicated that a company's board is responsible for the total process of risk management, as well as for forming its own opinion on the effectiveness of the process. In contrast, a company's management is accountable to the board for designing, implementing and monitoring the process of risk management and integrating it into the day-to-day activities of the company. Specifically, King II recommended that a risk management committee, consisting of executive and non-executive directors and chaired by an independent non-executive director, be set-up by the board to continuously review the risk management process; although overall responsibility for risk management should remain with the board.

Finally, and with respect to risk application and reporting, King II suggested that a comprehensive system of internal control should be established by the board to ensure that all risks are mitigated. Specifically, it recommended that risks should be assessed on an on-going basis and control activities should be designed to respond to risks throughout the company at all levels. Furthermore, a board must identify key risks areas and key performance indicators of the company, and monitor these factors as part of a regular review of processes and procedures in order to enhance the effectiveness of its internal systems of control. Crucially, King II required the board to comprehensively report/disclose in the annual report the following: (i) risk management policies; (ii) the

[3]We note that this definition is largely consistent with that of Linsley and Shrives (2006, p.402), who define risk broadly as "*any opportunity or prospect, or of any hazard, danger, harm, threat or exposure, that has already impacted upon the company or may impact upon the company in the future or of the management of any such opportunity, prospect, hazard, harm, or threat or exposure*".

process for identifying, evaluating and managing significant risks faced by the company; (iii) contingency plans for handling and preventing disastrous incidents from impacting on operations; (iv) the system of internal control and audit; (v) the internal system of risk reporting/communicating; and (vi) a statement that the board is accountable for the effectiveness of the overall process of risk management and the system of internal control.

While the pursuit of joint CG and CRD reforms in SA, contrasts with the experience in most Anglo-Saxon countries, but is similar to that in a number of Asian and continental European countries, the SA situation is also characterised by highly concentrated corporate ownership structure (Ntim et al., 2012). Distinct from most Asian and European countries, however, is that the ownership concentration is due to the existence of tall pyramids and complex cross-shareholdings by a few very large companies (King Committee, 2002).[4] Additionally, activism by shareholders, including institutional ones, is noticeably weak with the SA experience further characterised by poor record of implementing and enforcing corporate regulations (King Committee, 2002). In sum, these contextual issues seem to have significantly impaired the effectiveness of the market for corporate and managerial control in SA (Ntim et al., 2011; Ntim & Soobaroyen, 2012).

Thus, and in summary, although SA has arguably and uniquely pursued a combination of CG and CRD reforms compared with other Anglo-American countries, critical concerns have been raised as to whether a voluntary compliance regime like King II, can effectively improve CG and CRD standards. It is in this context that we seek to examine the association between CG and CRD.

3. A multi-theoretical framework for corporate risk disclosures (CRD)

Although corporate and academic interest in CRD has gradually increased in recent years (Beretta & Bozzolan, 2004; Cabedo & Tirado, 2004; Pirson & Turnbull, 2011), a comprehensive and uniform theoretical framework for investigating and explaining corporate motivations for engaging in it is yet to emerge (Deegan, 2002; Raj & Handley-Schachler, 2009). Currently, extant studies have tended to rely on different socio-political (i.e., institutional, legitimacy, and stakeholder) and economic (i.e., agency and resource-dependence) theories (Linsley & Shrives, 2006; Lopes & Rodrigues, 2007; Elzahar & Hussainey, 2012). Whereas individual socio-political and economic theories have generally been useful in explaining the motivations for CRD (Amran et al.,

[4]For example, the six largest pyramidical groups (namely, the Anglo American-De Beers, Rembrandt, Sanlam, Old Mutual, Liberty Life Insurance and Anglovaal Groups) control over 70% of the value of all stocks listed on the SA stock market, with the Anglo American-De Beers Group controlling 17 of the 20 largest quoted firms (Ntim et al., 2011).

2009; Greco, 2012), they have been limited in their individual ability to completely explain the various motivations influencing different CRD practices (Reverte, 2009; Oliveira et al., 2011).

Agency theory views the corporation as a nexus of contracts between utility maximising economic agents operating in efficient markets (Jensen and Meckling, 1976). In this setting, CRD may, for example, be relevant to investors in making investment, risk and return decisions (Cabedo & Tirado, 2004; Greco, 2012) by reducing information asymmetry between financial stakeholders (Ahmed et al., 2004; Rhodes & Soobaroyen, 2010). However, the relevance of agency theory in explaining the motivations for CRD has been suggested to be impaired because it predominantly directs CRD towards opportunistic financial agents, but who are apparently not the only beneficiaries of CRD (Gray et al., 1995; Abraham & Cox, 2007).

Resource-dependence theory suggests that companies that commit to high levels of transparency in the form of increased CRD can enjoy unique competitive advantages by gaining access to critical resources, such as finance (Pfeffer & Salancik, 1978; Branco & Rodrigues, 2006). Indeed, since it is costly to engage in CRD (in terms of financial, legal, proprietary, competition, regulation and taxation) issues (Lajili & Zeghal, 2005; Greco, 2012), benefits may accrue to the firm in the form of enhanced internal risk management, management expertise, corporate image and reputation (Linsley & Shrives, 2006; Branco and Rodrigues, 2006), as well as a cheaper cost of capital (Botosan, 1997; Mallin, 2002). However, resource-dependence theory has been criticised for indicating that CRD should be conducted primarily for corporate strategic motives instead of exhibiting responsibility and accountability to a broader range of corporate stakeholders (Parker, 2005; Lopes & Rodrigues, 2007).

Legitimacy theory and institutional theory both focus on the ability of the firm to achieve social acceptance (Deegan, 2002; Chen & Roberts, 2010). The former suggests that a firm's right to exist is legitimised if its value system is consistent with that of the larger social system of which it is part of, but threatened when there is actual or potential conflict between the two value systems (Asforth & Gibbs, 1990; Suchman, 1995). Similarly, institutional theory indicates that firms tend to incorporate external norms and rules into their operations and structures in order to gain legitimacy (DiMaggio & Powell, 1983; Scott, 1987). Thus, it can be argued that companies can gain social acceptance and legitimise their operations by engaging in CRD. Despite being very useful in explaining motivations for CRD (Edkins, 2009; Raj & Handley-Schachler, 2009), both theories are hindered by a number of weaknesses. These include vagueness regarding the identity of corporate stakeholders, prioritising financial stakeholders and limited capacity to predict and explain managerial behaviour (Gray et al., 1995; Deegan, 2002; Parker, 2005).

Finally, and closely related to legitimacy theory, the managerial stakeholder theory considers CRD as a tool used by corporations to manage or manipulate the informational needs of their various powerful stakeholders, such as shareholders, employees and government, in order to gain their approval, which is crucial for their survival (Freeman & Reed, 1983; Freeman, 1984). In this case, stakeholder theory is similar to or overlaps with legitimacy theory, but they are distinguished by the degree of resolution (Donaldson & Preston, 1995; Deegan, 2002), whereby legitimacy theory refers to a macro level social contract between a corporation and the larger society, and thus, the firm receives its legitimacy to exist from the society in general. In contrast, stakeholder theory provides a more refined resolution by identifying and referring to specific powerful stakeholders within the larger society, and hence, it is the identified stakeholders that confer legitimacy on a corporation (Gray et al., 1995; Reverte, 2009). In spite of its usefulness in explaining the motivations for CRD (Linsley et al., 2006; Amran et al., 2009; Oliveira et al., 2011), stakeholder theory has been criticised for directing CRD at the most powerful and influential stakeholders, of which the majority are financial stakeholders, and thereby pandering CRD to corporate self-interests (Deegan, 2002; Parker, 2005).

As the preceding suggests, there are clear limitations in each individual theoretical perspective's ability to explain CRD, and given the diversity in corporate motivations for CRD (Beretta & Bozzolan, 2004; Cabedo & Tirado, 2004), we instead adopt a multi-theoretical framework.[5] Following prior suggestions (Gray et al., 1995; Deegan, 2002), as well as recent evidence (Amran et al., 2009; Oliveira et al., 2011), we consider the range of individual approaches to be complementary rather than competing theories. Given the interdependencies or overlaps among the five theories, we argue that a combined consideration will provide a richer basis for understanding and explaining the motivations for CRD within the SA context.

4. Prior studies: Corporate risk disclosures, corporate governance and hypotheses development

Past studies (Meier et al., 1995; Beretta & Bozzolan, 2004; Linsley & Shrives, 2006; Abraham & Cox, 2007; Elzahar & Hussainey, 2012) have identified a number of variables that can affect CRD. This study draws from this, the CG (Beekes & Brown, 2006; Ntim et al., 2011; Bozec & Bozec, 2012), the voluntary disclosure (Eng & Mak, 2003; Collett & Hrasky, 2005; Barako et al., 2006), and the corporate social responsibility (CSR) (Gray et al., 1995; Deegan, 2002; Parker, 2005; Reverte, 2009; Fifka, 2012) literature, as well as the SA corporate setting

[5]We are, however, conscious of incompatibility problems that may arise when different theories are combined (Reverte, 2009; Oliveira et al., 2011). Therefore, as a multi-theoretical framework is expected to focus on common key concepts (Branco & Rodrigues, 2008; Chen & Roberts, 2010), agency, institutional, legitimacy, resource-dependence and stakeholder theories were selected on the basis of the commonality of their core concepts. Also, given the diverse nature of CRD, covering financial (market, liquidity, and credit) and non-financial (business/operational and strategic) risks, we consider it to be appropriate to adopt a multi-theoretical framework, whereby some theories may be more applicable in explaining certain CRD than others.

(Ntim et al., 2011, 2012; Ntim & Soobaroyen, 2012), to identify possible drivers of CRD. Distinct from most prior studies, we explore how firm-level CG quality in the form of ownership mechanisms (i.e., government ownership, block ownership and institutional ownership) and board characteristics (i.e., board diversity, board size, independent non-executive directors, and board leadership structure) drive CRD. Following past studies, we also investigate how general firm characteristics, including audit firm size, capital expenditure, the presence of CG and CSR committees, cross-listing, firm size, leverage, industry, profitability, sales growth and year, influence CRD.

4.1. Corporate governance: Corporate ownership mechanisms

Given the ruling SA government's formal commitment to the recommendations of King II relating to CRD (Ntim et al., 2011, 2012), our expectation is that SA companies with high government ownership will actively seek to win government support as a powerful stakeholder (stakeholder theory) (Freeman & Reed, 1983; Freeman, 1984; Gray et al., 1995) by complying with the King II rules (institutional theory) (DiMaggio & Powell, 1983; Scott, 1987) through either substantive and/or symbolic CRD that may not only help in legitimising (legitimacy theory) their operations (Ashforth & Gibbs, 1990; Suchman, 1995), but also secure access to critical resources (resource-dependence theory) (Pfeffer & Salancik, 1978; Branco and Rodrigues, 2006), such as finance that can enhance performance.

While agency theory suggests that increased CRD practices can help resolve agency problems between managers and government as an influential shareholder (Jensen and Meckling, 1976; Rhodes & Soobaroyen, 2010), some studies contrastingly view government ownership as exacerbating agency problems (agency theory) by impairing the effectiveness of internal managerial monitoring, including disclosure practices (Jia et al., 2009; Hou & Moore, 2010). For example, Hou and Moore (2010) report that the incidence of corruption and fraud is high (low) in Chinese firms with high (low) government ownership. On the other hand, they find that incidence of enforcement action by the regulatory authorities in response to corruption and fraud is low (high) in Chinese firms with high (low) government ownership. This implies that strong political connection associated with high levels of government ownership provides protection against greater scrutiny and discipline by weak regulatory authorities and corrupt public officials, and thereby leading to poor disclosure practices in such firms. However, through the Public Investment Commission (PIC), the SA government maintains strategic, but relatively low ownership stakes in large public corporations with the aim of encouraging CG, CSR, disclosure, growth, employment and redistribution (Ntim et al., 2011; Ntim & Soobaroyen, 2012). Most of these economic and political goals tend to be in direct conflict with the profit maximising objectives of private investors. Previous studies suggest that the greater

the degree of such conflicts among powerful stakeholders (stakeholder theory), such as government and private owners, the higher the need for resolution through increased disclosure, including CRD (Eng & Mak, 2003; Dam & Scholtens, 2012).

Prior empirical studies regarding the connection between government ownership and voluntary disclosure is limited, thereby making it a fertile area for further research, especially in SA where there is a clear dearth of CRD studies. Consistent with the conflicting theoretical predictions, the findings of past studies are mixed. For example, whereas Eng and Mak (2003), Ntim et al. (2011), Khan et al. (2012), and Ntim and Soobaroyen (2012) find that government ownership is positively associated with voluntary disclosure, Dam and Scholtens (2012) report that government ownership is negatively associated with voluntary disclosure. Despite the mixed findings, and given the specific role of the PIC, the SA government can be viewed as having relatively low, but strategic ownership stakes in large corporations with an explicit interest in encouraging good governance, social responsibility, transparency, and disclosure practices, including CRD (Ntim et al., 2012) and, hence, our first hypothesis is that:

H1: There is a statistically significant positive association between government ownership and the extent of corporate risk disclosures.

Agency theory indicates that increased managerial monitoring and reduced information asymmetry associated with concentrated ownership can be expected to minimise agency problems and improve performance (Jensen & Meckling, 1976; Greco, 2012), and, as such, a reduced need for CRD (Cabedo & Tirado, 2004; Raj & Handley-Schachler, 2009). That is, the need for public accountability through disclosure tends to be less in closely-held firms due to low outsider interests (Khan et al., 2012). Therefore, it appears that managers of firms with concentrated ownership structure are less likely to engage in disclosure because the costs of CRD (i.e., competition, litigation, and regulation) may be greater than its potential benefits (i.e., reduction in information asymmetry). In contrast, diffused ownership requires increased monitoring, which can be reduced through greater CRD (Beretta & Bozzolan, 2004; Oliveira et al., 2011). Where ownership is comparatively dispersed, a lack of disclosure can lead to information asymmetry between managers and owners, which can impact negatively on valuation. As such, discretionary disclosure, therefore, provides managers with opportunities to reduce such conflicts by engaging in comprehensive voluntary disclosure, including CRD.

Empirically, the findings of previous studies are largely consistent with the view that concentrated ownership structures leads to less voluntary disclosure compared with the dispersed alternative (Eng & Mak, 2003; Barako et al., 2006). For example, Reverte (2009), Khan et al. (2012), and Ntim and Soobaroyen (2012) report that closely-held firms disclose significantly less information on their CSR practices. Noticeably, empirical studies

examining the relationship between block ownership and CRD are scarce, with those by Lopes and Rodrigues (2007) and Oliveira et al. (2011) being rare exceptions. Both studies find that concentrated ownership has a negative effect on CRD. With specific reference to the SA context, corporate ownership has typically been dominated by a limited number of very large companies, mainly via complex cross-holdings and pyramidical structures (Ntim et al., 2011, 2012) and, thus, our prediction is that block ownership will affect CRD. However, public accountability and interests in such firms is relatively limited (Ntim & Soobaroyen, 2012) and therefore, we expect such firms to engage in low voluntary disclosures, including CRD. Thus, our second hypothesis is that:

H2: There is a statistically significant negative association between block ownership and the extent of corporate risk disclosures.

Agency theory suggests that due to their larger ownership stakes, institutional shareholders have extra incentive to closely monitor corporate disclosures (Abraham & Cox, 2007; Elzahar & Hussainey, 2012). Hence, managers will not only be expected to make more disclosures, including CRD ones, to meet the informational needs of institutional shareholders as powerful corporate stakeholders (stakeholder theory) (Amran et al., 2009; Abraham et al., 2012), but also to secure their support in order to legitimise (institutional and legitimacy theories) or justify their continued stewardship of the company and its resources (Edkins, 2009; Chen & Roberts, 2010). Thus, institutional shareholders can be considered as delegated monitors (agency and stakeholder theories) as they invest largely on behalf of ultimate shareholders, such as employees and pensioners. The primary objective of such investments is to create value for shareholders, and therefore, institutional shareholders tend to be keenly interested in CG, performance, and disclosure issues (Dam & Scholtens, 2012). Furthermore, because institutional shareholders often own a substantial proportion of a firm's shares, which cannot be easily sold, they are likely to be more interested in the firm's strategic decisions, such as investment and disclosure, than small investors.

Empirically, a number of studies have examined the association between institutional ownership and voluntary disclosure (Lopes & Rodrigues, 2007; Fifka, 2012). For instance, Barako et al. (2006) and Ntim et al. (2011) report that voluntary disclosure is high in firms with high institutional ownership. Similarly, Dam and Scholtens (2012), and Ntim and Soobaroyen (2012) find that institutional ownership leads to high CSR disclosures. Past studies investigating a direct link between institutional ownership and CRD are, however, limited. In this case, studies by Abraham and Cox (2007), and Elzahar and Hussainey (2012) are rare exceptions, with both finding that institutional ownership is positively related to CRD. As already noted in the SA context, the pervasive institutional ownership, largely in the form of pyramidical structures and complex cross-shareholdings (Ntim et al., 2011, 2012),

means that institutional ownership is likely to be an important driver of CRD. Given that King II urges institutional shareholders to actively seek to enhance disclosure practices in SA firms and, thus, our third hypothesis is that:

H3: There is a statistically significant positive association between institutional ownership and the extent of corporate risk disclosures.

4.2. Corporate governance: Corporate board characteristic variables

Generally, board diversity refers to the various features that may be present among directors that can affect decision-making (Carter et al., 2003; Van der Walt & Ingley, 2003). These characteristics include those that are directly observable (e.g., age, ethnicity, and gender) and those that are less visible (e.g., education, occupation, and religion) (Mahadeo et al., 2012). In this study, given that the King reports place special emphasis on board diversity on the basis of ethnicity and gender (King Committee, 1994, 2002), our investigation focuses mainly on ethnic and gender aspects of board diversity. Resource-dependence theory indicates that boards of diverse gender and ethnic backgrounds can help connect a company to its external environment and obtain resources (Pfeffer & Salancik, 1978; Oliveira et al., 2011), as well as enhance corporate legitimacy (legitimacy and institutional theories) (Scott, 1987; Ashforth & Gibbs, 1990; Edkins, 2009). Agency theory also suggests that boards of diverse ethnic and gender backgrounds can improve board independence and enhance managerial monitoring (Cabedo & Tirado, 2004; Elzahar & Hussainey, 2012). Similarly, stakeholder theory suggests that corporate boards of diverse backgrounds can help provide a better link with stakeholders (Donaldson & Preston, 1995; Amran et al., 2009), which can further enhance growth opportunities.

Although a number of empirical studies suggest that board diversity has a positive effect on a number of corporate outcomes (Carter et al., 2003; Mahadeo et al., 2012), evidence regarding the impact of board diversity on voluntary disclosures, such as CRD is scarce. For example, Carter et al. (2003) and Mahadeo et al. (2012) find that financial performance is higher in firms with boards formed by members from diverse ethnic and gender backgrounds than their homogenous counterparts. Similarly, Barako and Brown (2008), and Ntim et al. (2011) report that board diversity is positively related to voluntary disclosure, whereas Ntim and Soobaroyen (2012) find that CSR reporting is higher in firms with more diverse boards than their less diverse counterparts. Within the SA context, post-apartheid affirmative action regulations in the form of the 1998 employment equity (EE) and 2003 black economic empowerment (BEE) laws expect corporate boards, to be diverse in order to reflect the ethnic and gender composition of the SA populace. For example, the 2003 BEE act requires membership of senior management, including corporate boards to be formed by about 40% to 50% non-whites. Further, although King II

does not set any specific diversity targets for firms, it suggests that every company should consider whether its board is diverse enough in terms of skills and demographics (i.e., ethnicity and gender). It also encourages firms to comply with the provisions of the BEE and EE acts, thus indicating that King II expects board diversity to impact positively on corporate outcomes, including performance and voluntary disclosure. Therefore, given that the extent of CRD is largely a managerial discretion, our expectation is that diverse boards are more likely to put pressure (especially from black and female members) on senior managers to engage in greater CRD. Thus, our fourth hypothesis is that:

H4: There is a statistically significant positive association between board diversity on the basis of ethnicity and gender, and the extent of corporate risk disclosures.

Agency theory indicates that increased managerial monitoring associated with larger boards can have a positive influence on corporate disclosures, including CRD and performance (Bozec & Bozec, 2012; Elzahar & Hussainey, 2012). Similarly, stakeholder theory suggests that larger boards offer greater access to their firm's external environment, which reduces uncertainties and also facilitates the securing of critical resources, such as finance and business contracts (Jia et al., 2009). Also, resource-dependence theory indicates that larger boards enhance the knowledge base on which business advice can be sought, which increases managerial ability to make important and better business decisions (Hou & Moore, 2010). Furthermore, the theory indicates that larger boards are associated with greater diversity in terms of expertise (Branco & Rodrigues, 2006; Shrives et al., 2006), experience, and stakeholder (stakeholder theory) representation (Freeman, 1984; Lajili & Zeghal, 2005), which can enhance corporate legitimacy (institutional and legitimacy theories) and reputation (Suchman, 1995; Raj & Handley-Schachler, 2009). A contrary theoretical proposition from agency theory is that larger boards are bad, while smaller boards are good and effective at improving corporate performance and disclosure (Jensen & Meckling, 1976). Specifically, Jensen (1993) suggests that larger boards are often characterised by poor co-ordination, communication and monitoring, as well as greater director free-riding, which can impact negatively on CRD and performance. In contrast, smaller boards are often associated with frequent candid and effective discussions that can have a positive effect on performance and disclosure.

A number of studies have investigated the impact of board size on corporate performance and disclosure with conflicting findings (Beiner et al., 2006; Jia et al., 2009; Hou & Moore, 2010; Fifka, 2012). For instance, Beiner et al. (2006) and Henry (2008) find that board size is positively related to firm value, whilst Coles et al. (2008) and Guest (2009) report a negative link between board size and performance. Similarly, Jia et al. (2009) find that the incidence of corruption and fraud in Chinese firms with larger boards is higher than in their smaller

counterparts, implying that larger boards are poor at monitoring managers. In contrast, Hou and Moore (2010) report that board size has a negative effect on the incidence of fraud in China, suggesting that greater monitoring power associated with larger boards can minimise the extent of managerial corruption and fraud. Further, Ntim et al. (2011), and Ntim and Soobaroyen (2012) report that firms with larger boards disclose more information on their CG and CSR practices, respectively. Of closer relevance to our study, Elzahar and Hussainey (2012) find that board size has a positive effect on CRD.[6] With specific reference to the SA setting, King II does not specify the number of directors that a board should have, but suggests that every board must consider whether its size makes it effective; indicating that board size is considered as a crucial CG structure that can influence CRD. Given the mixed theoretical and empirical literature, however, our fifth hypothesis is that:

H5: There is a statistically significant association between board size and the extent of corporate risk disclosures.

Legitimacy theory indicates that there is a perception of the existence of a legitimacy gap in modern companies, in which ownership is distinct from control (Jensen & Meckling, 1976; Jensen, 1993), which can be resolved by selecting independent non-executive directors (*INED*) to represent corporate stakeholders (Freeman & Reed, 1983; Michelon & Parbonetti, 2012). Thus, the appointment of *INED* can be viewed as an attempt to enhance corporate legitimacy by signalling a match between corporate and societal values (Ashforth & Gibbs, 1990; Edkins, 2009). Similarly, agency and stakeholder theories suggest that the presence of *INED* can be viewed as an important CG structure, not only to resolve agency problems between managers and shareholders (Linsley & Shrives, 2006; Oliveira et al., 2011), but also to advance the interests of other stakeholders, such as employees and local communities (Amran et al., 2009; Chen & Roberts, 2010). In this case, *INED* are viewed as offering the necessary checks and balances required to improve the effectiveness of a board in advising, monitoring and disciplining top management. Moreover, the increased independence and accountability associated with *INED* suggests that their presence may enhance corporate response to stakeholder concerns relating to CRD (Lopes & Rodrigues, 2007; Pirson & Turnbull, 2011). As such, *INED* are viewed as more able to respect and honour the obligations of the firm and are generally keener in encouraging greater transparency and voluntary disclosure, as doing so may improve their personal prestige and social standing (Michelon & Parbonetti, 2012). Further, *INED* normally have limited involvement in the day-to-day running of the firm, but tend to be exposed to higher levels of risk in terms of their

[6]We note that a number of studies suggest a non-linear relationship between board size and performance (Coles et al., 2008; Guest, 2009). Similarly, other studies indicate that block ownership and institutional ownership are non-monotonically related to performance (Morck et al., 1988; Beiner et al., 2006). Thus, the relationship between these variables and CRD may be curvi-linear, and as such, we investigate a non-linear relationship between the three variables and CRD, as part of our additional analyses. We are also grateful to an anonymous reviewer for this suggestion.

personal reputation (Oliveira et al., 2011). Therefore, *INED* have greater incentives to demand greater transparency and disclosure from top management in order to balance the high risk to their personal reputation (Lopes & Rodrigues, 2007).

Empirically, and consistent with the theoretical predictions, a large number of studies report that *INED* have a positive effect on a number of different corporate outcomes, such as performance (Beiner et al., 2006; Henry, 2008; Mahadeo et al., 2012), voluntary disclosure (Eng & Mak, 2003; Barako et al., 2006; Ntim et al., 2011), CSR disclosure (Barako & Brown, 2008; Khan et al., 2012; Michelon & Parbonetti, 2012; Ntim & Soobaroyen, 2012), reducing the incidence of corruption and fraud (Jia et al., 2009; Hou & Moore, 2010), and risk disclosure (Abraham & Cox, 2007; Lopes & Rodrigues, 2007; Oliveira et al., 2011; Elzahar & Hussainey, 2012). With regard to the SA setting, King II requires corporate boards of directors to be formed by a majority of *INED*, indicating that the presence of *INED* is generally viewed as a positive development, with potential positive implications for performance and disclosure, including CRD. Therefore, our sixth hypothesis is that:

H6: There is a statistically significant positive association between the percentage of INED and the extent of corporate risk disclosures.

An important CG issue is corporate board leadership structure. A dual board leadership structure (*DBLS*) refers to a situation whereby the roles of the chief executive officer (CEO – management) and chairman (control) of the board are performed by different individuals. The chairman of the board is responsible for managing the board. These may typically include nominating new board members, reviewing the performance of senior management, setting agenda for board meetings, and settling conflicts which may arise within the board (Elzahar & Hussainey, 2012). In contrast, the CEO is responsible for the day-to-day management of the company, including implementing board decisions. A number of alternative theories (e.g., agency, resource-dependence and stakeholder theories) suggest that *DBLS* can have a positive effect on corporate performance and disclosure (Freeman, 1984; Jensen, 1993; Reverte, 2009). For example, agency theory suggests that separating the board chairperson and CEO positions can substantially enhance the board's capacity to monitor and discipline managers by improving board accountability and independence (Barako et al., 2006), which can have a positive effect on CRD. Resource-dependence theory indicates that *DBLS* does not only expand corporate access to resources, such as executive talent and experience (Henry, 2008; Bozec & Bozec, 2012), but also improves legitimacy (legitimacy theory) and stakeholder representation (stakeholder theory) by signifying greater democracy in executive decision-making

(Elzahar & Hussainey, 2012), as well as signalling managerial willingness to commit to high levels of transparency and accountability (Beiner et al., 2006; Ntim et al., 2012).

By contrast, a number of other studies suggest that role duality (i.e., combining the roles of CEO and Chairman) leads to better corporate outcomes (Khan et al., 2012; Michelon & Parbonetti, 2012). For instance, employment of resource-dependence theory indicates that as an insider, the CEO tends to have greater knowledge, understanding and experience of the strategic challenges and opportunities, which the company faces, than a non-executive chairman; impacting positively on performance (Barako et al., 2006; Elzahar & Hussainey, 2012). Similarly, agency theory indicates that role duality grants a charismatic CEO the opportunity to have a sharper focus on firm objectives, thereby allowing a visionary CEO the opportunity to shape the long-term fortunes of a firm with minimum board interference (Beiner et al., 2006; Henry, 2008). This may lead to improved performance due to the rapid management decision-making that arises from the provision of clear and unambiguous corporate leadership. Agency theory further suggests that unified firm leadership often associated with role duality improves managerial accountability as it makes it easier to charge the blame for poor performance (Khan et al., 2012; Michelon & Parbonetti, 2012).

Empirically, past evidence largely suggests that *DBLS* (CEO role duality) has a positive (negative) effect on different corporate outcomes. For example, Beiner et al. (2006) and Henry (2008) find that corporate financial performance is higher in firms with *DBLS* than those with CEO role duality, whilst Barako et al. (2006) report a positive relationship between *DBLS* and voluntary disclosure. Similarly, Khan et al. (2012), Michelon and Parbonetti (2012), and Ntim and Soobaroyen (2012) find that *DBLS* leads to higher CSR disclosures. Of direct importance to our study, Elzahar and Hussainey (2012) report that *DBLS* has a positive effect on CRD. With respect to the SA context, King II explicitly encourages SA companies to adopt *DBLS* in order to enhance corporate disclosure and performance and, therefore, our final hypothesis is that:

H7: There is a statistically significant positive association between dual board leadership structure and the extent of corporate risk disclosures.

5. Research design

5.1. Data considerations

Our sample is based on all 169 non-financial companies listed on the Johannesburg Stock Exchange (JSE) with full data from 2002 to 2011, selected from 5 main industries: basic materials; consumer goods; consumer

services; industrials; and technology/telecoms.[7] As the findings of past studies suggest that company size and industry influence CG and CRD (Cabedo & Tirado, 2004; Bozec & Bozec, 2012; Elzahar & Hussainey, 2012; Ntim et al., 2012), we chose the largest 10 companies from each of the five industries based on their market capitalisation in order to control for size and industry. Thus, our final sample was made up of 50 companies over 10 firm-years, resulting in a total of 500 firm-year observations from five industries for our regression analyses.[8] The CG and CRD variables were collected from the sampled corporations' annual reports downloaded from the *Perfect Information Database*, whereas the financial variables were collected from *DataStream*.

5.2. Definition of variables and model specification

We classify our variables into three main types, with full definitions and mnemonics presented in Appendix 1 and Table 1. In order to test *H1* to *H7*, our main dependent variables are the summary CRD scores – *CRDS* (*CRDI*), which seek to measure the quantity/volume (quality/level) of CRD in three major areas as set out by King II, comprising of: (i) financial (*CFRDS/CFRDI*); (ii) operational/business (*CORDS/CORDI*); and (iii) strategic (*CRDS/CSRDI*) corporate risk disclosures. This constitutes one of the largest CRD datasets to be used to-date and we utilise the widely used content analysis method of codifying written 'texts', 'numbers/tables' and 'graphs/pictures' into various categories to collect all our CRD data (see Krippendorff, 1980, 2004; Hackston & Milne, 1996; Unerman, 2000; Beattie & Thompson, 2007; Hooks & Van Staden, 2011).

[7]Our sample excludes companies from financial and utilities sectors, which are (i) subject to heavy regulations, (ii) highly geared in terms of capital structure, and (iii) inherently risk management entities; characteristics which can impact differently on their performance, CRD and CG structures, and should, therefore, be studied independently (Linsley & Shrives, 2006; Linsley et al., 2006). The exclusion of financials/utilities also facilitates direct comparisons to be drawn with the findings of previous studies (Cabedo & Tirado, 2004; Amran et al., 2009; Oliveira et al., 2011; Elzahar & Hussainey, 2012), which also excluded such companies. Thus, and following previous studies (Beretta & Bozzolan, 2004; Abraham & Cox, 2007; Greco, 2012), we limit our sample to 291 non-financials out of a total of 402 JSE listed companies. Our sample begins from 2002 because King II became operational in 2002. Our sample ends in 2011 because: (i) it was the latest year for which data is available, and (ii) we are interested in longitudinal behaviour of CRD, including the years before and after the 2007/2008 global financial crisis. However, and to ensure consistency in the longitudinal analysis, we included only companies with the full data needed from 2002 to 2011 inclusive. Twenty-eight and 94 companies had no and incomplete data, respectively. Finally, the extensiveness of the CG and CRD data, coupled with the labour intensive nature of manual collection limited our final sample to 50 out of the 169 companies with full data based on firm size and industry.

[8]Our sample selection criteria were set for a number of reasons. First, following previous studies (Oliveira et al., 2011; Elzahar & Hussainey, 2012), the criteria ensured that the conditions for a balanced panel analysis were met. Some of the statistical benefits for using panel data include having both time-series and cross-sectional observations, and less multicollinearity among the variables (Gujarati, 2003; Wooldridge, 2010). Second, investigation of a ten-year data with both cross-sectional and time series properties may be helpful in ascertaining whether the observed cross-sectional connection between CG and CRD holds over-time. A potential weakness of our sample selection criteria is that it may introduce survivorship bias into the sample selection process. However, the criteria generated a reasonable number of observations and thus, generalisability of the results of our study should arguably not be seriously impaired by our sample selection criteria. To be certain, however, we further investigated this potential problem by following Beiner et al. (2006) and compare the characteristics of our final 50 sampled firms to those of the 263 firms out of the initial 291 firms with at least one year's financial data available rather than the complete ten years. Specifically, we test for equality in means and medians of all our financial variables, including capital expenditure, firm size, leverage, operating profit and sales growth, between our final balanced sample of 50 firms and the unbalanced sample of 263 firms. If the two groups display similar features, then we can conclude that our final sample is representative of the underlying population. The results (which for brevity are not reported, but available upon request) indicate that there are no statistically significant differences in the mean or median values for all the variables. We interpret this observation as suggesting that the characteristics of our final 50 sampled firms are largely similar to the underlying population and that our findings are not likely to be seriously affected by survivorship bias.

As presented in Appendix 1, and given the well articulated limitations of quantity measures, such as word, and sentence counts (Unerman, 2000; Hackston & Milne, 1996; Beattie & Thomson, 2007; Hooks & Van Staden, 2011) and qualitative proxies, such as disclosure indices (Bozec & Bozec, 2012; Ntim et al., 2011, 2012), we use both in order to improve the robustness of our results. Specifically, we employ sentence count as our unit of measurement for a number of reasons. First, and as discussed in previous studies (Unerman, 2000; Hackston & Milne, 1996; Linsley & Shrives, 2006), although words can arguably be counted with a high degree of accuracy and objectivity, they cannot be coded without reference to the underlying sentence, and using sentences thus minimises incidences of coding non-risk disclosures. Second, empirical studies (e.g., Hackston & Milne, 1996; Beattie & Thomson, 2007; Hooks & Van Staden, 2011) suggest that sentences provide complete, reliable and meaningful data for analysis. Third, the use of sentence is a well-established line of coding risk disclosures, which has been employed extensively by past studies (Lajili & Zegal, 2005; Linsley & Shrives, 2006; Amran et al., 2009; Raj & Handley-Schachler, 2009; Oliveira et al., 2011; Elzahar & Hussainey, 2012; Greco, 2012), and can also facilitate direct comparisons to be drawn with the findings of previous studies.

As previously discussed, we adopt the broad definition of risk offered by King II and Linsley and Shrives (2006) to identify, classify and code the risk disclosures. This involves a number of steps. First, sentences were coded as risk disclosures if the reader is reasonably informed (i.e., based on reading) of "*any opportunity or prospect, or of any hazard, danger, threat or exposure, that has already impacted upon the company or may impact upon the company in the future or of the management of any such opportunity, prospect, hazard, harm, threat or exposure*" (Linsley & Shrives, 2006, p.402). However, as suggested by Elzahar and Hussainey (2012), risk disclosures should be stated explicitly rather than implicitly. As such, any disclosure that was too vague to be classified as a risk disclosure was not coded. Therefore, every part of the annual reports were searched for risk disclosures although a good number of our sampled firms devoted separate sections of their reports for risk management and reporting, often as part of the CG report. Second, and based on King II, the risk disclosures (*CRD*) were classified into three main categories: financial (*CFRD*); operational/business (*CORD*) (non-financial); and strategic (*CSRD*) (non-financial) (see Appendix 1). Third, following past studies (Beretta & Bozzolan, 2004; Cabedo & Tirado, 2004; Linsley & Shrives, 2006; Abraham & Cox, 2007; Oliveira et al., 2011), the risk disclosures were further classified along the following dimensions (see Table 3): past/future, bad/negative, good/positive, qualitative/non-monetary, and quantitative/monetary information. The risk disclosures were also classified according to the three main disclosure formats (see Table 4): texts (TXT); numbers/tables (N/T); and

graphs/pictures (G/P). Fourth, with respect to the quantity measures (*CRDS*, *CFRDS*, *CORDS*, and *CSRDS*) (see Table 2), we counted the total number of risk disclosures in sentences along both the three main categories and the various dimensions. In terms of the quality measures (*CRDI*, *CFRDI*, *CORDI*, and *CSRDI*) (see Appendix 1), the risk disclosure sentences were coded on a scale of '0' to '6', whereby '0' referred to 'no risk disclosure information is contained' and '6' implied 'complete risk disclosure information', containing all dimensions of risk disclosure. The total scores were then expressed as a percentage, ranging from the lowest (0%) to the highest (100%) (Appendix 2 contains examples of risk disclosures and how they were classified and coded).[9]

Insert Table 1 about here

To further test *H1* to *H7*, data was collected on ownership, including block ownership (*BOWN*), government ownership (*GOWN*), and institutional ownership (*IOWN*) and board characteristics, including board size (*BSIZE*), independent non-executive directors (*INED*), and board diversity on the basis of ethnicity and gender (*BDIV*). Additionally, and to control for potential omitted variables bias (Gujarati, 2003; Wooldridge, 2010), we included an extensive number of control variables. These covered audit firm size (*BIG4*), capital expenditure (*CAPX*), cross-listing (*CLIST*), the presence of a CG committee (*CGCO*), the presence of a CSR committee (*CSRCO*), leverage (*LEV*), firm size (*LNTA*), profitability (*OPFT*), risk (*RISK*), sales growth (*SGR*), industry dummies (*IND*), and year dummies (*YED*). For brevity, we do not develop direct theoretical links between these control variables and CRD, but there is extensive theoretical and empirical literature that suggests they can influence CRD (Beretta & Bozzolan, 2004; Cabedo & Tirado, 2004; Linsley & Shrives, 2006; Abraham & Cox, 2007; Amran et al., 2009; Oliveira et al., 2011; Elzahar & Hussainey, 2012; Greco, 2012).

Companies normally differ in the opportunities and challenges that they encounter over time (Petersen, 2009; Larcker & Rusticus, 2010). This can result in a scenario whereby CRD and CG practices are jointly and dynamically determined by unobserved company-specific hetereogeneities, such as managerial talent, corporate culture and complexity (Henry, 2008; Guest, 2009), which simple OLS regressions may be unable to detect (Gujarati, 2003; Wooldridge, 2010). Hence, given the panel nature of our data and following past studies (Henry, 2008; Guest, 2009; Ntim et al., 2012), we conduct our analyses by using panel data regression techniques in order to control for potential endogeneities that may arise from unobserved company-specific heterogeneities. Therefore,

[9]A single coder performed the content analysis for this study. However, to ensure consistency, reliability, and validity, an initial sample of 10 annual reports (2 from each industry) were coded independently by two coders. In the first stage of pre-testing or piloting, each coder coded 5 annual reports. No major differences emerged, and minor differences were discussed and agreed, with no differences emerging in the subsequent (second stage) pre-testing of the coding instrument on the remaining 5 annual reports between the two coders.

and assuming all the hypothesised relations are linear, our main fixed-effects regression model to be estimated is specified as follows:

$$CRD_{it} = \alpha_0 + \beta_i \sum_{i=1}^{7} CG_{it} + \sum_{i=1}^{12} \beta_i CONTROLS_{it} + \gamma_i + \varepsilon_{it} \quad (1)$$

where *CRD* is either our quantity (*CRDS*) or quality (*CRDI*) proxy for corporate risk disclosures, *CG* refers to the seven corporate governance variables, namely, *BOWN, GOWN, IOWN, BDIV, BSIZE, INED* and *DBLS*, and *CONTROLS* refers to the control variables, including *BIG4*, *CAPX*, *CGCO*, *CLIST*, *CSRCO*, *LEV*, *LNTA*, *OPFT*, *RISK*, *SGR*, *IND* and *YED*, with γ referring to the company-specific fixed-effects, consisting of a vector of the mean-differences of all time variant variables.[10]

We present the empirical analyses, including the descriptive statistics, bivariate and multivariate regression analyses and additional analyses in the following sections.

6. Empirical results and discussion

6.1. Descriptive statistics, univariate and bivariate analyses

Panels *A* and *B* of Table 2 present summary descriptive statistics of the quantity/sentence count (*CRDS*) and quality/disclosure index (*CRDI*) measures and the three thematic categories: financial (*CFRDS*/*CFRDI*), operational/business (*CORDS*/*CORDI*), and strategic (*CSRDS*/*CSRDI*) for all firm years, as well as for each of the ten firm-years investigated, respectively. A number of interesting findings emerge from the descriptive statistics. First, they suggest that there is a considerable degree of variation in the disclosures. For instance, *CRDS* (*CRDI*) ranges from a minimum of 17 (6.42%) to a maximum of 1,183 (72.45%) with the median firms disclosing 483 (39.37%) sentences (disclosure index score), respectively. Second, and consistent with previous CRD studies (Raj & Handley-Schachler, 2009; Greco, 2012), there has been a steady increase in corporate risk disclosures over time. For instance, the average corporation disclosed 241 (15.63%), 285 (17.94%), 333 (20.46%), 371 (24.75%), 418 (31.32%), 506 (36.45%), 589 (42.63%), 649 (49.46%), 728 (52.61%) and 780 (55.93%) sentences (disclosure index score), respectively, in 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2011, accounting for over 200

[10]We acknowledge that our choice is between fixed- and random-effects, but a Hausman specification test rejected random-effects in favour of fixed-effects. Intuitively, this is consistent with the use of non-random/stratified instead of a random sampling procedure. We also follow Guest (2009) and Ntim et al. (2012) in implementing the mean-difference technique, which is more robust in the presence of hetereoscedasticity (Gujarati, 2003; Wooldridge, 2010). However, we get essentially similar results if we run our fixed-effects models by employing the year dummy alternative instead of the mean-difference method.

percentage points increase over the ten-year period investigated. This appears to suggest that SA listed corporations attach some importance to risk management and disclosure.

Insert Table 2 about here

Third, similar increasing patterns can be observed with respect to the three *CRD* thematic categories. For example, *CFRDS* (*CFRDI*) range from 2 (3.70%) to 240 (59.26%) with an average of 108 (30.52%) sentences (disclosure index score) and increasing steadily from 22 (8.75%) in 2002 to 174 (45.03%) in 2011. The pattern of increases in *CORDS* (*CORDI*) and *CSRDS* (*CSRDI*) are similar to those of *CRDS* (*CRDI*). Fourth, and on comparative basis, disclosure levels are highest in the case of *CORDS* (*CORDI*) and least with respect to *CFRDS* (*CFRDI*). This is not surprising, since unlike the *CFRDS* (*CFRDI*) and *CSRDS* (*CSRDI*) which contain 9 and 11 disclosure items respectively, the *CORDS* (*CORDI*) scope is broader, covering 30 disclosure items ranging from issues, such as governance to customer satisfaction. As will be discussed further, the findings also provide support for past evidence (Beretta & Bozzolan, 2004; Abraham & Cox, 2007; Greco, 2012), which suggests that CRD are primarily non-financial in nature. Further, recent evidence (Oliveira et al., 2011; Elzahar & Hussainey, 2012; Greco, 2012) suggests that corporations tend to make more disclosures regarding their operational and strategic risks during a financial crisis. The focus on non-financial (i.e., operational and strategic) risks, therefore, seems to partly reflect the operational (i.e., business) and strategic (i.e., economy wide) challenges that were experienced by the sampled companies during the recent 2007/2008 global financial crisis. Finally, and although there is evidence that the level of CRD in the pre-07/08 period (i.e., 2002 to 2006) is lower than that of 07/08 period, those of the post-07/08 period (i.e., 2009 to 2011) are also higher than that of 07/08, suggesting a generally increasing trend in CRD behaviour over time. This indicates that CRD behaviour during the 07/08 global financial crisis was not substantially or uniquely different from that in the pre- and post-periods. For example, and consistent with the general increasing trend in CRD behaviour over-time, the average corporation scored 31.32% (418 sentences) of the total of 265 disclosure points in 2006 compared with 36.45% (506 sentences), 42.63% (589 sentences), 49.46% (649 sentences), 52.61% (728 sentences), and 55.93% (780 sentences) in 2007, 2008, 2009, 2010, and 2011, respectively, with the three sub-categories also depicting largely similar CRD behaviour over-time.

As the CRD reported in Table 2 only indicates the quantity/volume (sentence count) and quality/level (disclosure index) rather than the focus of the disclosures, Table 3 contains summary descriptive statistics of CRD behaviour with particular regard to their focus. To quantify the focus of the CRD, we classify the CRD sentences into ‘past/historical/backward looking’ versus ‘future/forward looking’, ‘bad/negative’ versus ‘good/positive’, and

'qualitative/non-monetary' versus 'quantitative/monetary' and express each category as a percentage of the total CRD sentences. Irrespective of the type of CRD examined, and consistent with the findings of previous studies (Lajili & Zeghal, 2005; Berger & Gleibner, 2006; Linsley & Shrives, 2006; Oliveira et al., 2011; Greco, 2012), the main evidence emerging from Table 3 is that CRD are largely focused on 'past', 'good', 'qualitative' and 'non-financial' oriented information. For example, about 82% of CRD are non-financial in nature (i.e., operational/business and strategic) compared with 18% financial ones. Similarly, about 27%, 14%, and 38% of CRD are focused on 'past/historical', 'good/positive' and 'qualitative/non-monetary' oriented information, respectively, compared with 12%, 6%, and 3% for 'future/forward looking', 'bad/negative', and 'quantitative/monetary' oriented information. The CRD behaviour for the three sub-categories is also generally similar to that of the summary measure. Further, past evidence (Amran et al., 2009; Abraham & Cox, 2007; Oliveira et al., 2011) suggests that managers tend to disclose historical', 'positive' and 'qualitative' oriented risk information because it is helpful in promoting corporate legitimacy, good image, and reputation (legitimacy theory). In contrast, 'forward looking', 'negative' and 'quantitative' oriented information is, more reliable and useful to stakeholders (stakeholder theory), such as investors in making investment decisions.

Finally, and with regard to the focus of CRD behaviour over the ten-year period examined, the evidence is mixed with no clear cut trend emerging in terms of the pre-, during and post-07/08 financial crisis. For example, Table 3 suggests that past information contained in *CRDS* constituted 28%, 26%, 29%, 30%, 29%, 25%, 24%, 26%, 27%, and 25% in 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, and 2011, respectively, suggesting erratic instead of consistent changes in the focus of the disclosures. Similar inconsistent trends are observable for the three sub-categories, indicating that the 07/08 financial crisis has not necessarily changed the focus of the CRD.

Insert Table 3 about here

To provide evidence on the various formats through which CRD are communicated, Table 4 presents the percentage of companies disclosing each of the 50 risk items under the three different formats: 'texts (TXT)'; 'numbers/tables (N/T)'; and 'graphs/pictures (G/P)'. First, and irrespective of the type of risk investigated, the main new evidence from Table 4 is that CRD are predominantly comprised of 'texts/narratives' with a small number of the risk disclosures being in the form of 'numbers/tables' and 'graphs/pictures', providing further support for the evidence contained in Tables 2 and 3 that CRD are largely non-financial and qualitative in nature. For example, whereas about 65% of the sampled firms disclosed information relating to interest rates in the form of texts/narratives, only 22% and 2% did so in the form of 'numbers/tables' and 'graphs/pictures', respectively.

Second, and also in line with the findings reported in Tables 2 and 3, the percentage of firms making financial risk disclosures is the lowest, whilst those making operational/business risk disclosures is the highest. Third, the risk item with the least percentage of disclosure is 'financial instruments/derivatives', whilst the item with the highest percentage is 'taxation'. Finally, a major policy implication that can be drawn from the analysis of the descriptive statistics is that regulatory authorities and policy-makers need to pay greater attention to both the nature and format of CRD. Specifically, regulatory authorities can improve risk reporting by encouraging corporations and managers to disclose more 'forward-looking', 'quantitative' and 'monetary' oriented risk information that are likely to be more accurate, reliable, and relevant to stakeholders, such as investors and employees, in their decision making.

Insert Table 4 about here

Table 5 reports the summary descriptive statistics for all the independent and control variables included in our analysis, with all distributions generally showing wide spreads. For example, *BDIV* ranges from a minimum of 8% to a maximum of 89% with the average firm having about 31% of its board members being non-white. This suggests that despite the recommendations of King II and BEE act regarding the need for greater diversity in corporate boardrooms, SA boards remain predominantly white. In line with the results of past research (Ntim et al., 2012), *BSIZE* is between 4 and 21 with an average of 11 board members, whereas *DBLS* suggests that over 98% of firms have a dual leadership structure. The values of *BOWN*, *GOWN*, *INED* and *IOWN*, as well as the control variables, suggest wide variability in our sample, which minimises any possibilities of sample selection bias.

Insert Table 5 about here

Table 6 presents the correlation matrix for the variables used in our regression analysis to test for multicollinearity. For robust results, we report both the Pearson's parametric and Spearman's non-parametric coefficients, and, it is noticeable that the magnitude and direction of both coefficients are generally similar; indicating that no serious non-normality problems exist. Apart from the high (i.e., 0.769 in the case Pearson or 0.758 in the case of Spearman) level of correlation between our quantity/volume/sentence count (*CRDS*) and quality/level/disclosure index (*CRDI*) measures, the bivariate correlations among the variables are fairly low, implying that there are no major multicollinearity problems. In addition, we examined scatter plots for *P-P* and *Q-Q*, studentised residuals, Cook's distances and Durbin-Watson statistics for homoscedasticity, linearity, normality and autocorrelation, respectively, with the tests indicating no serious violation of these linear assumptions (for brevity not reported, but available upon request).

Insert Table 6 about here

Further, Table 6 shows statistically significant connections between *CRDS* (*CRDI*) and CG variables, and also between *CRDS* (*CRDI*) and the control variables. For instance, and as predicted, *BDIV*, *BSIZE*, *GOWN* and *INED* are statistically significant and positively related to the *CRDS* (*CRDI*), whilst *BOWN* is statistically significant and negatively connected to the *CRDS* (*CRDI*).

6.2. Multivariate regression analyses

Table 7 contains the results of the fixed-effects regression analysis of the impact of CG on CRD based on the quantity/volume (sentence count) measure. Generally, the results suggest that the CG variables are significant in explaining differences in *CRDS*. To begin with, the coefficients on *BOWN* and *IOWN* in Model 1 of Table 7 are negative and statistically significant, implying that SA corporations with high *BOWN* and *IOWN* are more likely to make significantly less risk disclosures. The negative connection between *BOWN* and *CRDS* is in line with theoretical suggestions that *BOWN* mitigates agency conflicts (i.e., providing support for agency theory) by acting as a substitute for other CG mechanisms, and that there is a lesser need for managers to engage in high risk disclosures in order to legitimise their decisions/actions to shareholders. Our results also offer empirical support for *H2* and previous evidence (Lopes & Rodrigues, 2007; Oliveira et al., 2011), which suggests that *BOWN* has a negative effect on CRD.

By contrast, the negative link between *CRDS* and *IOWN* does not provide empirical support for *H3*, or to the findings of past studies (Abraham & Cox 2007; Elzahar & Hussainey, 2012), which indicate that *IOWN* has a positive impact on CRD. It also generally contradicts the findings of studies that document a positive relationship between *IOWN* and voluntary disclosure (Barako et al., 2006; Ntim et al., 2011; Dam & Scholtens, 2012; Ntim & Soobaroyen, 2012). The findings appear to indicate that institutional shareholders are more like to be block-owners, whose information needs seem to have been met through direct contact rather than via CRD. As previously discussed, whilst institutional ownership in SA is pervasive, it is largely held in the form of tall pyramidical structures and complex cross-shareholdings. Thus, disclosure behaviour, including CRD of firms with high institutional ownership is more akin-to those with high block ownership because there is low public interest and thus, limited need for greater transparency and stakeholder accountability (stakeholder theory). The statistically significant and positive link between *BOWN* and *IOWN* (see Table 6) appears to support this interpretation. The economic significance of our evidence is that a one-standard deviation increase (decrease) in the *BOWN* and *IOWN*, for example, can be expected to be associated with a 5.5% (22.10 x 0.249) and 3.3% (23.76 x 0.138) decrease (increase) in *CRDS*, respectively.

The coefficients on *GOWN*, *BDIV*, *BSIZE*, and *INED* are statistically significant and positively related to *CRDS*, implying that *H1*, and *H4* to *H6* are empirically supported. In contrast, *DBLS* has a positive, but statistically insignificant connection between *DBLS* and *CRDS* fails to offer empirical support for *H7*, or to the findings of Elzahar and Hussainey (2012). This may be explained by the ubiquitous nature of *DBLS* in SA (i.e., as reported in Table 5, on average, over 98% of the sampled firms have a *DBLS*) primarily due to the fact that it is an important part of the recommendations of King II, resulting in limited cross-sectional variation among the sample firms. It also suggests further that the agency theory explanation that separating the roles of CEO and chairman can enhance CRD by improving the effectiveness of managerial monitoring may not be applicable in corporate settings, such as SA, where a majority of firms have *DBLS*.

The positive connection between *GOWN* and *CRDS* offers empirical support for the results of Eng and Mak (2003), Ntim et al. (2011), Khan et al. (2012), and Ntim and Soobaroyen (2012), but is inconsistent with the findings of Dam and Scholtens (2012) that suggest that government ownership is negatively associated with voluntary disclosure. It also provides further empirical support for our multi-theoretical framework that incorporates insights from institutional, legitimacy, resource-dependence and stakeholder theories. One theoretical implication of this is that the SA government is a powerful stakeholder (stakeholder theory) for corporations with high *GOWN*. Thus, corporations commit to high levels of CRD in order to signal their congruence with government initiatives, values, norms and rules (institutional and legitimacy theories), and thereby facilitate access to critical resources, such as government contracts and concessions (resource-dependence theory). This appears to be the case in SA, where the government is a powerful stakeholder with strategic *GOWN*, and has shown keen interest in affirmative action, stakeholder, CG and disclosure issues (Ntim et al., 2011; Ntim & Soobaroyen, 2012).

The positive link between *BDIV* and *CRDS* offers empirical support for the findings of Barako and Brown (2008), Ntim et al. (2011), and Ntim and Soobaroyen (2012), which suggest that corporate boards of diverse ethnic and gender backgrounds tend to make more voluntary disclosures. More generally, the evidence adds to the results of past studies (e.g., Carter et al., 2003; Mahadeo et al., 2012) that indicate that board diversity on the basis of gender and ethnicity has a positive effect on organizational outcomes. Together, our board diversity results appear to offer high empirical support for the predictions of our multi-theoretical framework that incorporates insights from agency, institutional, legitimacy and stakeholder theories. That is, they indicate that boards of diverse ethnic and gender backgrounds are not only able to engage in greater managerial monitoring (agency theory), but can also help to provide a better connection with stakeholders (stakeholder theory), gain access to critical resources, such as

business contracts and contacts (resource-dependence), and enhance corporate legitimacy and reputation (institutional and legitimacy theories). A contextual explanation is that affirmative action regulations, such as EE and BEE that expect corporate boards to be diverse in order to reflect the ethnic and gender composition of the SA populace are prevalent (Ntim et al., 2011; Ntim & Soobaroyen, 2012). This leads to the formation of relatively diverse boards that are more able to put pressure (especially by the black and female members) on senior managers to engage in greater CRD.

Further, the positive association between *CRDS* and *BSIZE* provides empirical support for the findings of Elzahar and Hussainey (2012), and finally, the positive connection between *CRD* and *INED* is consistent with previous evidence (Abraham & Cox, 2007; Oliveira et al., 2011; Elzahar & Hussainey, 2012) that *INED* has a positive effect on CRD. Overall, both results seem to suggest that the predictions of our mult-theoretical framework that incorporates insights from agency, institutional, legitimacy, resource-dependence and stakeholder theoires is highly applicable. For instance, larger boards are associated with greater managerial monitoring power (agency theory) and diversity in terms of expertise (resource-dependence) and stakeholder representation (stakeholder theory), which can enhance corporate legitimacy and reputation (institutional theory and legitimacy theory). Additionally, agency theory suggests that greater accountability, independence and responsibility associated with *INED* makes them more likely to respond to stakeholder concerns regarding CRD, as well as able to put pressure on managers to commit to high levels of CRD. Overall, our evidence is not only statistically significant, but also economically important. Specifically, our results suggest that a one-standard deviation increase (decrease) in the *BDIV*, *BSIZE*, *GOWN* and *INED*, for instance, can be expected to be associated with a 3.6% (16.40 x 0.219), 0.43% (3.49 x 0.125), 2.6% (9.89 x 0.265) and 3.7% (18.54 x 0.199) increase (decrease) in *CRDS*, respectively.

Insert Table 7 about here

Furthermore, our findings so far suggest that differences in the *CRDS* can largely be explained by the CG variables, but since the proxy contains CRD from three different categories, it is possible for the connection between each category and the CG variables to differ, with some potentially having strong links with the CG variables and others maintaining weak associations. Thus, to examine the link between each CRD category and the CG variables, we re-estimate equation (1) by replacing the *CRDS* with either the *CFRDS*, *CORDS* and *CSRDS* in turns, and the findings are, respectively, presented in Models 2 to 4 of Table 7. The coefficient on *BOWN* is shown to be statistically significant and negatively related to all three CRD sub-categories. Similarly, the coefficients on *GOWN*, *BDIV* and *INED* remain statistically significant and positively associated with all three CRD categories,

whereas those on *DBLS* remain positive and statistically insignificant, offering further empirical support for our previous evidence. In contrast, the statistical significance of the coefficients on *IOWN* and *BSIZE* are mixed. The coefficients on *IOWN* are negatively related to all three CRD categories, but none are statistically significant. Similarly, the coefficients on *BSIZE* remain positively associated with all three CRD categories, but only the coefficient on *CORDS* is statistically significant, evidence which in the main, is inconsistent with our previous findings that suggested that *BSIZE* is significantly and positively associated with *CRDS*, whilst *IOWN* is significantly and negatively related to *CRDS.*

6.3. Additional analyses

We carry out a raft of additional analyses to ascertain the robustness of our findings. First, and to ascertain whether the CRD behaviour and drivers differ over the pre- and post-2007/2008 global financial crisis periods, we re-run equation (1) by splitting our sample period into three sub-sample periods: pre-2007/2008 (i.e., 2002 to 2006); 2007 to 2008; and post-2007/2008 (i.e., 2009 to 2011), with the results presented in Models 5, 6 and 7, respectively, of Table 7 being essentially the same as those reported in Model 1 of the same table (apart from observable minor sensitivities in the magnitude of the coefficients). This suggests that our evidence is largely robust to sub-sample estimations.

Second, and following Larcker and Rusticus (2010), we estimate a lagged CRD-CG structure in order to additionally address potential endogeneity problems, whereby CRD and CG may be simultaneously determined, instead of the implicit theoretical and empirical assumption that CG influences CRD, by re-regressing equation (1) as a lagged structure specified as:

$$CRD_{it} = \alpha_0 + \beta_i \sum_{i=1}^{7} CG_{it-1} + \sum_{i=1}^{12} \beta_i CONTROLS_{it-1} + \gamma_i + \varepsilon_{it-1} \quad (2)$$

where everything remains the same as defined in equation (1) except that we include a one year lag between *CRD* and CG in which the current year's *CRD* depends on the previous year's CG. Noticeably, the results presented in Model 8 of Table 7 are generally similar to those presented in Model 1 of the same table. This implies that our evidence is robust to estimating a lagged CRD-CG structure.

Third, to examine whether our results are sensitive to the CRD proxy employed, we replicate our results in Table 7 by replacing our quantity/volume/sentence count CRD measure (*CSRDS*) with its quality/level/disclosure index alternative (*CSRDI*), and the results are reported in Models 1 to 7 of Table 8. Apart from slight sensitivities in the magnitude and statistical significance levels, our results based on sentence count reported in Table 7 remain

qualitatively the same as those presented in Models 1 to 7 of Table 8 based on the disclosure index. Given the high correlation between the *CRDS* and *CRDI* proxies (0.769 in the case of Pearson and 0.758 in the case of Spearman) (see Table 6), this is not surprising and thus, suggests that our findings are robust whether CRD is quantitatively or qualitatively measured.

Insert Table 8 about here

Fourth, to account for potential endogeneities that may be caused by omitted variable bias, we rely on the widely used two-stage least squares (*2SLS*) methodology (Beiner et al., 2006; Henry, 2008). However, to ensure that the *2SLS* methodology is appropriate, and following Beiner et al. (2006), we first conduct a Durbin-Wu-Hausman exogeneity (Beiner et al., 2006, p. 267) test for the existence of an endogenous connection between the *CRD* and *CG* variables. Applied to equation (1), the test rejects the null hypothesis of no endogeneity, and hence, we conclude that the *2SLS* methodology may be ideal and that our fixed-effects results may be spurious. In the first stage, and based on extensive theoretical and empirical literature (Jensen & Meckling, 1976; Beekes & Brown, 2006; Bozec & Bozec, 2012; Fifka, 2012; Ntim et al., 2011, 2012), we conjecture that our seven CG variables will be determined by all the twelve control variables. In the second stage, we employ their predicted parts as instruments and re-estimate equation (1) as follows:

$$CRD_{it} = \alpha_0 + \hat{\beta}_i \sum_{i=1}^{7} CG_{it} + \sum_{i=1}^{12} \beta_i CONTROLS_{it} + \gamma_i + \varepsilon_{it} \qquad (3)$$

where everything remains unchanged as specified in equation (1) except that we use the predicted parts from the first-stage estimation as instruments for the seven CG variables. The results reported in Model 8 of Table 8 are essentially similar to those presented in Model 1 of Tables 7 and 8, thereby implying that our evidence is robust to potential endogeneities that may arise from omitted variables. The slight increase in the magnitude of the coefficients of the CG variables in Model 8 of Table 8 compared with those in Model 1 of Tables 7 and 8 is generally consistent with previous evidence that instrumented parts of CG variables tend to predict *CRD* more strongly than their un-instrumented parts (Beiner et al., 2006; Larcker & Rusticus, 2010; Ntim et al., 2012).

Finally, a number of studies indicate that the impact of some CG mechanisms, such as *BOWN*, *BSIZE* and *IOWN* on corporate performance is non-monotonic (Morck et al., 1988; Beiner et al., 2006; Guest, 2009). For example, *BOWN*, *BSIZE*, and *IOWN* have been found to be non-linearly connected to corporate performance by Morck et al. (1988), Beiner et al. (2006), and Coles et al. (2008), respectively. To detect the presence of non-linear links between the CG mechanisms and CRD, we re-estimate equation (1) by including squared transformations of

BOWN, *BSIZE*, and *IOWN*. The findings are reported in Model 9 of Table 8. Noticeably, the coefficients on $BOWN^2$, $BSIZE^2$ and $IOWN^2$ in Model 9 of Table 8 are statistically insignificant, with the findings remaining essentially the same as our previous findings contained in Table 7. Thus, our evidence does not provide empirical support for the presence of a curvilinear (including other transformation, such as cubic) link between the CG variables and CRD.

7. Summary and conclusion

The 2007/2008 global financial crisis has highlighted the need for effective corporate governance (CG) through sound risk management and reporting practices. This paper has attempted to examine the crucial question of whether the quality of firm-level CG has any impact on the quality and extent of corporate risk disclosures (CRD) in South Africa (SA) from 2002 to 2011, covering the pre- and post-2007/2008 period. This also coincides with a period during which the SA authorities pursued CG and CRD policy reforms that explicitly require corporations to provide more transparent information on a set of recommended good risk management practices. Our findings, therefore, extent, as well as make a number of new contributions to the literature.

First, as the reasons for corporate engagement in CRD are diverse and often conflicting, we contribute to the literature by articulating and applying for the first time a multi-theoretical framework for interpreting CRD that incorporates unique insights from agency, institutional, legitimacy, resource-dependence, and stakeholder theories. Second, and using one of the largest datasets to-date on CG and CRD, we find that CRD are largely 'non-financial (i.e., mainly 'operational' and 'strategic' risks)', 'historical', 'good news' and 'qualitative' in nature over the ten-year period investigated. Additionally, we find evidence of a general increasing CRD trend over the period before, during, and after the 2007/2008 global financial crisis. By contrast, we do not find any evidence to suggest that corporate risk disclosure behaviour during the 2007/2008 period is substantially different from those of the pre- and post-2007/2008 periods, Second, explicit content analysis of the number of sentence counts and the disclosure indices generally indicates that despite the expectation that the introduction of the 2002 King Report would speed-up convergence of risk management and reporting practices, CRD among SA listed firms still differ substantially. However, the observed variability in CRD is largely consistent with those reported by previous studies, specifically demonstrating that a high degree of heterogeneity exists when it comes to the importance that listed companies in the SA context attach to CRD. Further, and despite concerns as to whether a voluntary CRD regime will be effective given the uniqueness of the SA corporate context, both our quantity and quality CRD measures indicate that risk disclosures among the sampled firms have generally improved over the ten-year period investigated.

Third, and with respect to the determinants of CRD, we find that block ownership and institutional ownership are negatively associated with the extent of CRD, whereas board diversity, board size and independent non-executive directors are positively related to the extent of CRD. By contrast, dual board leadership structure has no significant connection with the extent of CRD. Our results are robust across a number of econometric models that sufficiently control for different types of endogeneity problems, as well as alternative CG and CRD proxies. Generally, our findings provide empirical support for the predictions of our multi-theoretical framework.

Fourth, our findings have important implications for policy-makers and regulators. Evidence of increasing CRD suggests that efforts by various stakeholders, noticeably the SA Institute of Directors, at improving risk management and reporting have had some positive impact on the level of risk management and disclosure in the firms examined. However, given the wide differences in the level and focus of CRD suggests that some attention to the quality of risk disclosures by companies is required if they are to be useful to stakeholders. Specifically, regulatory authorities can enhance risk reporting by encouraging corporations and managers to disclose more 'forward-looking', 'quantitative' and 'monetary' oriented risk information that are likely to be more accurate, reliable, and relevant to stakeholders, such as investors and employees, in their decision making. One possible suggestion is to adopt a disclosure framework that ensures that CRD meet a minimum threshold of relevance and reliability. In this case, developing a CRD framework along the lines of those proposed by the Global Reporting Initiative may be a step in the right direction.

Finally, although our study is important and robust, its weaknesses need to be explicitly acknowledged and a future research agenda identified. While our sample is limited to SA companies, future studies can adopt our multi-theoretical framework within a cross-country context, enabling a more explicit generalisation of the results. Similarly, and as we exclude financials and utilities from our sample, new insights may be gained by investigating these types of companies in the future. Our use of sentence counts and disclosure indices as our proxies for CRD have well-articulated limitations (see Hackston & Milne, 1996; Unerman, 2000; Beattie et al., 2004; Hooks & Van Staden, 2011), and whereas our results based on both our quantity and quality measures are essentially similar, future studies may enhance the analysis by using other measures, such as word counts and page counts. Further, due to data limitations, our analysis focused essentially on internal CG mechanisms, and future studies may enhance their analysis by investigating how external CG mechanisms, such as regulations, the media, and market for corporate control, influence CRD practices.

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Appendix 1

Corporate risk disclosures (CRD) index			
CRD theme/type	**CRD item: information on or reference to**	**Range of scores**	**Total score per theme**
	Corporate financial risk disclosures		
(i) Financial	1. Interest rates	0-6	54
	2. Exchange rates	0-6	
	3. Commodity prices	0-6	
	4. Liquidity	0-6	
	5. Credit/default	0-6	
	6. Capital adequacy/insolvency	0-6	
	7. Equity prices	0-6	
	8. Financial derivatives/instrument	0-6	
	9. Executive compensation/bonus/employee pension commitments	0-6	
	Corporate non-financial risk disclosures		
(ii) Operational/ Business	10. Competition/proprietary/copyright	0-6	145
	11. Business processes and procedures/operations	0-6	
	12. Technology/information technology	0-6	
	13. Health and safety	0-6	
	14. Environment	0-6	
	15. Reputation/goodwill/image/brand name	0-6	
	16. HIV/Aids	0-6	
	17. Black economic empowerment/affirmative action	0-6	
	18. Compliance	0-6	
	19. Legal	0-6	
	20. Sourcing/raw material	0-6	
	21. Production/product development	0-6	
	22. Marketing/customer satisfaction/boycott	0-6	
	23. Social contribution/community support	0-6	
	24. Internal audit and control	0-6	
	25. Human resources/employee/labour turnover/unrest	0-6	
	26. Integrity/management and employee fraud	0-6	
	27. Governance/leadership and management	0-6	
	28. Product/service failure	0-6	
	29. Non/financial reporting/disclosure/communication	0-6	
	30. Business ethics/corruption	0-6	
	31. Off balance sheet/contingent assets and liabilities	0-6	
	32. Stock/service obsolescence and shrinkage	0-6	
	33. Disclosure of risk mgt. policies/board statement/responsibilities	0-1	
	34. Disclosure of risk governance/committee existence	0-1	
	35. Disclosure of risk committee composition	0-1	
	36. Risk committee chairperson independence	0-1	
	37. Disclosure of risk committee members' meetings attendance	0-1	
	38. Disclosure of risk committee remit	0-1	
	39. Disclosure of risk committee membership	0-1	
(iii) Strategic	40. Sovereign/politics	0-6	66
	41. Regulation	0-6	
	42. Taxation	0-6	
	43. GDP growth/market demand/aggregate demand	0-6	
	44. Unemployment rate	0-6	
	45. Inflation rate	0-6	
	46. Natural disasters/terrorism	0-6	
	47. Money supply/quantitative easing	0-6	
	48. Oil price	0-6	
	49. Public/budget deficit	0-6	
	50. Interest rate	0-6	
Total	**50 CRD items**		**265**
Scoring procedure			
0:	No risk disclosure information		
1:	Risk disclosure focusing on only past/backward looking/historical information		
2:	Risk disclosure focusing on past/backward looking and future/forward looking information		
3:	Risk disclosure focusing on past, future and bad/negative news information		
4:	Risk disclosure focusing on past, future, bad/negative and good/positive news information		
5:	Risk disclosure focusing on past, future, bad/negative, good/positive and qualitative/non-monetary information		
6:	Risk disclosure focusing on past, future, bad/negative, good/positive, qualitative and quantitative/monetary information		

Appendix 2
Examples of corporate risk disclosures coding rules application

Company name	Examples of risk disclosures	Risk disclosure category	Risk disclosure sub-category	Classification /Coding
AngloGold Ashanti Group	"Some of AngloGold Ashanti's mineral deposits and mining and exploration operations are located in countries that have experienced political instability and economic uncertainty. In all of the countries where AngloGold Ashanti operates, the formulation or implementation of government policies may be unpredictable on certain issues including regulations which impact on its operations and changes in laws relating to issues such as mineral rights and asset ownership, taxation, royalties, import and export duties, currency transfers, restrictions on foreign currency holdings and repatriation of earnings." (AngloGold Ashanti, 2009, p.188).	Non financial (strategic risk)	Politics/regulation/ taxation	Future/negative/qualitative/non-monetary
MTN Group	"The risk of bad debts from MTN's subscribers has always been low because MTN has a predominantly prepaid client base. The risk of bad debts from key distributors is equally low as a result of the stringent credit policy and payment terms. The recoverability of interconnect debt from other operators in certain of MTN's operating countries remains a risk to the Group and is problematic in certain operations. The expansion of the Group has reduced the overall impact of this as a result of reduced dependency on certain markets relating to this risk." (MTN, 2007, p.121).	Financial	Credit/default	Past/future/qualitative/non-monetary
Nampak Group	"The South African operations have adopted a comprehensive HIV and AIDS awareness programme. Altogether 94% of employees underwent training in South Africa, 100% in both Namibia and Swaziland. As a result of this training, 85% of employees attended voluntary counselling and testing sessions on site (up from 68.5% in 2008) and 99% in both Swaziland and Namibia. The current prevalence rate is below that reported by other manufacturing companies and employees are continuously encouraged to come forward for testing and counselling." (Nampak, 2009, p.49).	Non-financial (operational risk)	HIV/Aids	Past/good/qualitative/quantitative/non-monetary
Barloworld Group	"In line with our commitment to lead in empowerment and transformation, all of our South African divisions achieved an audited Level 4 or better rating in terms of the DTI's BBBEE scorecard. Equipment, motor retail and handling exceeded target by achieving Level 3 while Avis Rent a Car achieved Level 2. These ratings are a source of competitive advantage as they allow our customers to claim 100% credit or more for their procurement spending with us for the purpose of their own BEE scorecards." (Barloworld, 2009, p.13).	Non-financial (operational risk)	Black economic empowerment/affirmative action	Past/positive/qualitative/quantitative/non-monetary
Sabmiller Group	"The results reported by the group are affected by currency movements. During the financial year, whilst the South African rand was relatively stable against the US dollar and ended the financial year at R6.20 to the US dollar, the weighted average rand/dollar rate deteriorated by 3% to R6.41 compared with R6.22 in the prior year. The Colombian peso has stayed largely level against the US dollar since the Bavaria transaction, ending the financial year at COP2,292 to the US dollar, against COP2,300 at the time of the transaction. Currencies in central Europe strengthened against the US dollar and this has contributed to the improvement in reported results." (Sabmiller, 2006, p.24).	Financial	Exchange rates	Past/bad/qualitative/quantitative/monetary
AngloGold Ashanti Group	"In 2002 we reported a strong safety performance with Lost Time Injury Frequency Rate (LTIFR) of 0.37 injuries per 200,000 hours worked (2001: 0.58 injuries per 200,000 hours worked). Given the high emphasis that Ashanti places on the safety and health of its employees, I am pleased to announce that we have further improved upon our 2002 performance and achieved a LTIFR of 0.30 injuries per 200,000 hours worked in 2003." (AngloGold Ashanti, 2003, p.4).	Non-financial (operational risk)	Health and safety	Past/positive/qualitative/quantitative/non-monetary
Remgro Group	"During the past financial year the economic climate in South Africa was stable due to government's sustained maintenance of fiscal and monetary discipline. Prime interest rates decreased sharply from 17% to 11.5% following the decrease in the inflation rate which is currently in line with monetary policy's guideline of between 3% and 6%. Interest rates in real terms are thus still high compared to South Africa's trading partners and competitors in the world market. The strengthening of the South African rand against foreign currencies had a negative effect on the economy. The stability of the SA rand during the past financial year is however heartening and creates a climate for improved planning for the business sector." (Remgro, 2004, p.10).	Non-financial (strategic risk)	Inflation rates/interest rates/money supply/public budget deficit	Past/positive/qualitative/quantitative/non-monetary
Aspen Pharmacare Group	"In order to meet the diverse regulatory requirements across all of the markets concerned, significant investment has been made in the establishment of a dedicated regulatory team to ensure compliance with the applicable pharmaceutical legislation in the various territories into which these products are sold. In addition to managing the registration process of products for multiple territories, the regulatory team also facilitates adherence to specific packaging, product quality and stability requirements which may be unique to a territory." (Aspen Pharmacare, 2009, p.45).	Non-financial (strategic risk)	Politics/Regulatory	Past/qualitative/non-monetary
Aveng Group	"The Aveng Anti-Corruption Framework, which was developed in 2008, leverages the compliance programme and sets the parameters for ethical and fair practices throughout the Group, including training on all competition matters across all operations. The Group has also maintained a hotline as a precautionary measure to uncover any unethical or unlawful activities." (Aveng, 2009, p.22).	Non-financial (operational risk)	Business ethics/corruption	Past/qualitative/non-monetary

Table 1
Summary of definitions and operationalisation of variables

Corporate risk disclosures (CRD) variables – quantity/volume measure (sentence count)	
CRDS	Is the total corporate risk disclosure (*CRD*) proxy covering three main types of risks: (i) financial; (ii) non-financial (business/operational); and (iii) non-financial (strategic). It measures the extent (in terms of sentence count) and nature (in terms of the three specified types) of *CRD* in corporate annual reports, which is normalised by taking a natural log.
CFRDS	Is the total sentence count of corporate financial risk disclosures (*CFRD*) covering risk arising from adverse changes in nine broad areas: interest rates; exchange rates; equity prices; commodity prices; liquidity; credit; financial instruments/derivatives; capital adequacy/insolvency; and executive compensation/bonus/employee pension commitments, which is normalised by taking a natural log.
CORDS	Is the total sentence count of corporate operational/business risk disclosures (*CORD*) relating to thirty different risk areas arising from internal day-to-day decisions and risks that a company willingly assume in order to create a competitive advantage and generate value for shareholders, as specified in the Appendix, which is normalised by taking natural logs.
CSRDS	Is the total sentence count of corporate strategic risk disclosures (*CSRD*) covering eleven different risk areas arsing from basic changes in the external/macro economic environment as specified in the Appendix, which is normalised by taking natural logs.
Corporate risk disclosures (CRD) variables – quality/level measure (disclosure index)	
CRDI	A CRD index containing 50 items based on the three major types of risk specified by King II: (i) financial (*CFRDI*); (ii) non-financial (operational/business - *CORDI*); and (iii) non-financial (strategic - *CSRDI*). All 50 items (except seven, all of which are scored from 0 to 1) have a score ranging from 0 to 6, resulting in a total potential score of 265; scaled to a value between 0% and 100%. The Appendix contains the detailed 50 items and the scoring procedure.
Corporate governance (CG)/ownership and board characteristics variables	
BDIV	Percentage of male and female non-white directors (blacks, Asians and mixed race) to the total number of directors on the board of a company.
BOWN	Percentage of ordinary shares held by shareholders with at least 5% of the total company ordinary shareholdings.
BSIZE	Natural log of the total number of directors on the board of a company.
DBLS	1, if the positions of company chairperson and CEO are held by different persons, 0 otherwise.
GOWN	Percentage of government ownership to total company ordinary shareholdings.
INED	Percentage of independent non-executive directors to the total number of directors on the board of a firm.
IOWN	Percentage of ordinary shares held by institutional shareholders.
Control variables	
BIG4	1, if a firm is audited by a big four audit firm (PricewaterhouseCoopers, Deloitte & Touche, Ernst & Young, and KPMG), 0 otherwise.
CAPX	Percentage of total capital expenditure to total assets.
CGCO	1, if a company has set up a corporate governance committee, 0 otherwise
CLIST	1, if a company is listed on a foreign stock market, 0 otherwise.
CSRCO	1, if a company has set up a corporate social responsibility committee, 0 otherwise.
LEV	Percentage of total debt to total assets.
LNTA	Natural log of total assets.
OPFT	Percentage of operating profit to total assets.
RISK	Standard deviation of the OPFT variable.
SGR	Percentage of current year's sales minus previous year's sales to previous year's sales.
IND	Dummies for each of the five main industries: basic material + oil gas; consumer goods, consumer services + health care; industrials; and technology + telecoms firms.
YED	Dummies for each of the ten years from 2002 to 2011 inclusive.

Table 2
Summary descriptive statistics of all corporate risk disclosures

	All	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Panel A: Corporate risk disclosures based on quantity/volume measure (sentence count)											
Total corporate financial risk disclosures (CFRDS – total sub sentence count)											
Mean	108	22	39	46	54	65	93	119	130	156	174
Median	120	18	35	43	48	57	79	110	125	139	160
STD	86	15	28	32	40	44	58	66	72	78	84
Min	02	02	02	02	02	02	07	07	07	07	07
Max	240	66	78	86	95	122	140	175	194	212	240
Total corporate operational/business risk disclosures (CORDS – total sub sentence count)											
Mean	276	155	170	197	218	236	261	304	330	355	373
Median	238	136	172	199	205	217	265	318	339	371	386
STD	263	110	135	154	172	195	209	225	230	240	248
Min	11	11	11	11	16	18	33	48	52	58	69
Max	545	274	306	330	359	370	401	442	479	493	545
Total corporate strategic risk disclosures (CSRDS – total sub sentence count)											
Mean	136	62	74	88	96	113	149	160	186	212	230
Median	122	58	72	85	98	117	152	149	173	200	216
STD	162	45	69	71	85	94	120	130	142	146	154
Min	04	04	06	06	06	06	13	17	25	31	39
Max	398	155	174	210	233	257	290	336	359	370	398
Total corporate risk disclosures (CRDS – total sentence count)											
Mean	526	241	285	333	371	418	506	589	649	728	780
Median	483	210	279	320	356	410	485	574	642	710	775
STD	678	182	238	265	299	348	394	435	456	483	498
Min	17	17	19	19	24	26	53	72	84	96	115
Max	1,183	495	558	626	687	749	830	953	1,032	1,075	1,183
Panel B: Corporate risk disclosures based on quality/level measure (disclosure index - %)											
Total corporate financial risk disclosures (CFRDI - % sub score)											
Mean	30.52	8.75	9.98	13.44	17.25	25.31	33.06	37.75	40.88	42.70	45.03
Median	27.78	7.40	9.26	12.96	14.81	24.07	31.48	37.04	40.74	42.59	44.44
STD	15.46	2.03	3.09	3.61	4.12	5.19	7.21	10.58	11.33	12.88	14.43
Min	3.70	3.70	3.70	3.70	3.70	3.70	7.41	7.41	7.41	7.41	7.41
Max	59.26	11.11	14.81	16.67	18.52	22.22	33.33	44.44	48.15	53.70	59.26
Total corporate operational/business risk disclosures (CORDI - % sub score)											
Mean	48.65	17.86	19.74	22.28	27.62	31.42	42.18	49.85	57.43	63.49	66.72
Median	48.27	16.65	17.93	20.69	26.90	29.66	38.62	47.59	55.17	60.69	65.52
STD	22.45	5.75	7.46	8.25	9.02	10.65	13.23	16.32	17.06	18.96	20.54
Min	7.59	7.59	7.59	7.59	12.41	12.41	12.41	12.41	14.48	14.48	14.48
Max	88.28	28.27	33.79	37.24	44.83	49.66	58.62	71.03	75.86	82.76	88.28
Total corporate strategic risk disclosures (CSRDI - % sub score)											
Mean	37.95	13.75	16.38	18.39	21.75	24.89	32.40	43.68	46.50	52.39	57.86
Median	36.36	12.12	15.15	18.18	21.67	22.73	30.30	37.78	42.24	48.48	54.46
STD	19.81	3.79	5.06	5.62	6.93	8.01	9.96	12.22	14.18	16.86	18.55
Min	4.55	4.55	4.55	6.06	6.06	6.06	7.58	7.58	9.09	9.09	9.09
Max	75.76	18.18	22.72	25.75	30.30	34.85	42.42	51.51	60.06	69.70	75.76
Total corporate risk disclosures (CRDI – total % score)											
Mean	41.97	15.63	17.94	20.46	24.75	31.32	36.45	42.63	49.46	52.61	55.93
Median	39.25	14.72	16.60	19.62	23.34	29.81	34.72	41.51	45.28	48.30	52.21
STD	18.37	6.61	7.66	8.71	10.91	11.86	13.33	14.18	15.44	16.70	17.57
Min	6.42	6.42	6.42	6.42	6.42	7.92	7.92	9.43	9.43	9.43	9.43
Max	72.45	30.19	33.96	37.74	45.66	50.57	55.85	60.38	64.90	69.43	72.45

Table 3
Summary descriptive statistics of all corporate risk disclosures as a percentage of total sentence counts

	All	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Corporate risk disclosures based on the quantity/volume measure (sentence count)											
Total corporate financial risk disclosures (CFRDS – as % of total sub sentence count)											
Past	38	40	36	39	42	40	36	33	35	37	39
Future	10	9	12	10	8	11	14	12	10	12	10
Bad	4	5	3	4	2	3	7	9	8	6	5
Good	22	18	17	19	22	19	13	11	14	15	16
Qual.	20	24	25	23	20	20	21	25	25	24	24
Quan.	6	4	7	5	6	7	9	10	8	6	6
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Total corporate operational/business risk disclosures (CORDS – as % of total sub sentence count)											
Past	24	26	23	25	27	24	22	20	21	23	25
Future	15	12	14	13	11	13	12	14	17	14	13
Bad	4	4	5	5	6	6	8	9	10	8	8
Good	14	13	14	16	14	12	10	11	12	14	13
Qual.	41	42	40	38	40	42	44	43	38	39	38
Quan.	2	3	4	3	2	3	4	3	2	2	3
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Total corporate strategic risk disclosures (CSRDS – as % of total sub sentence count)											
Past	28	26	29	27	25	28	24	22	25	27	29
Future	10	12	10	13	16	14	17	15	13	11	12
Bad	8	7	6	6	5	6	9	10	10	8	6
Good	12	15	14	12	14	13	11	13	14	15	14
Qual.	39	36	38	40	37	36	35	37	36	37	36
Quan.	2	4	3	2	3	3	4	3	2	2	3
Tota	*100*	*100*	*l00*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Total corporate risk disclosure (CRDS – a % of total sentence count)											
Past	27	28	26	29	30	29	25	24	26	27	25
Future	12	12	13	10	14	12	14	13	14	14	12
Bad	6	5	7	5	4	4	6	8	9	8	7
Good	14	14	12	16	13	16	14	15	16	15	13
Qual.	38	39	40	36	35	37	38	35	30	32	40
Quan.	3	2	2	4	4	2	3	5	5	4	3
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Total corporate financial and non-financial risk disclosures as % of total corporate risk disclosures (sentence count)											
FIN	18	19	16	20	22	17	16	14	19	22	24
NOF	82	81	84	80	78	83	84	86	81	78	76
Total	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

Table 4

Percentage of companies disclosing each of the 50 risk items under the three different formats: texts (TXT), numbers/tables (N/T) and graphs/pictures (G/P)

Corporate financial risk disclosures	*TXT*	*N/T*	*G/P*	*Corporate operational/bus. risk disclosures*	*TXT*	*N/T*	*G/P*	*Corporate strategic risk disclosures*	*TXT*	*N/T*	*G/P*
Interest rates	65	22	2	Competition/ proprietary/copyright	93	42	30	Sovereign/politics	69	0	0
Exchange rates	67	13	5	Business processes and procedures/operations	100	36	12	Regulation	76	23	0
Commodity prices	68	27	1	Technology/information technology	96	41	8	Taxation	100	100	0
Liquidity	75	26	7	Health and safety	99	36	31	GDP growth/market demand/aggregate demand	94	75	12
Credit/default	72	23	15	Environment	97	28	20	Unemployment rate	95	69	8
Capital adequacy/insolvency	77	34	18	Reputation/goodwill/image/brand name	100	25	18	Inflation rate	98	85	40
Equity prices	89	37	15	HIV/Aids	94	16	14	Natural disasters/terrorism	24	2	0
Financial derivatives/instrument	18	6	2	Black economic empowerment/affirmative action	99	37	30	Money supply/quantitative easing	52	30	4
Executive compensation/bonus/employee pension commitments	100	92	0	Compliance	100	16	28	Oil price	86	64	29
-	-	-	-	Legal	85	24	7	Public/budget deficit	62	36	7
-	-	-	-	Sourcing/raw material	76	20	9	Interest rate	69	48	4
-	-	-	-	Production/product development	97	19	22	-	-	-	-
-	-	-	-	Marketing/customer satisfaction/boycott	100	38	25	-	-	-	-
-	-	-	-	Social contribution/community support	87	30	28	-	-	-	-
-	-	-	-	Internal audit and control	94	37	22	-	-	-	-
-	-	-	-	Human resources/employee/labour turnover/unrest	100	25	14	-	-	-	-
-	-	-	-	Integrity/management and employee fraud	18	4	0	-	-	-	-
-	-	-	-	Governance/leadership and management	100	35	17	-	-	-	-
-	-	-	-	Product/service failure	67	33	2	-	-	-	-
-	-	-	-	Non/financial reporting/disclosure/communication	100	100	85	-	-	-	-
-	-	-	-	Business ethics/corruption	22	3	0	-	-	-	-
-	-	-	-	Off balance sheet/contingent assets and liabilities	40	36	2	-	-	-	-
-	-	-	-	Stock/service obsolescence and shrinkage	51	28	4	-	-	-	-
-	-	-	-	Disclosure of risk management policies/board statement/responsibilities	76	0	0	-	-	-	-
-	-	-	-	Disclosure of risk governance/committee	76	47	35	-	-	-	-
-	-	-	-	Disclosure of risk committee composition	76	44	37	-	-	-	-
-	-	-	-	Disclosure of risk committee chairperson	76	40	34	-	-	-	-
-	-	-	-	Disclosure of risk committee members' meetings attendance	58	37	26	-	-	-	-
-	-	-	-	Disclosure of risk committee remit	76	0	0	-	-	-	-
-	-	-	-	Disclosure of risk committee membership	76	42	15	-	-	-	-

Table 5
Summary descriptive statistics of the independent and control variables for all 500 firm years

Variable	Mean	Median	STD	Maximum	Minimum
Panel A: Independent (corporate governance/ownership and board characteristics) variables					
BDIV (%)	31.46	24.00	16.40	89.02	7.80
BSIZE	11.29	11.00	3.49	21.00	4.00
BOWN (%)	54.62	53.08	22.10	96.44	5.94
DBLS (%)	98.95	100.00	36.04	100.00	0.00
GOWN (%)	8.49	6.83	9.89	78.57	0.00
INED (%)	47.12	44.63	18.54	94.62	5.38
IOWN (%)	78.30	88.90	23.76	98.73	5.94
Panel B: Control variables					
BIG4 (%)	86.72	100.00	36.11	100.00	0.00
CAPX (%)	8.43	6.85	6.49	64.76	0.00
CGCO (%)	50.00	50.00	50.00	100.00	0.00
CLIST (%)	39.44	0.00	48.73	100.00	0.00
CSRCO (%)	37.89	0.00	54.92	100.00	0.00
LEV (%)	49.53	52.61	17.50	92.74	2.38
LNTA	3.89	3.80	0.87	5.97	0.75
OPFT (%)	14.76	13.75	10.51	78.52	-20.44
RISK (%)	34.60	20.39	45.90	394.38	2.97
SGR (%)	4.76	8.72	29.63	95.69	-97.40

Notes: Variables are defined as follows: board diversity on the basis of ethnicity and gender (*BDIV*); board size (*BSIZE*); block ownership (*BOWN*); dual board leadership structure (*DBLS*); government ownership (*GOWN*); independent non-executive directors (*INED*); institutional ownership (*IOWN*); audit firm size (*BIG4*); capital expenditure (*CAPX*); the existence of a corporate governance committee (*CGCO*); cross-listing (*CLIST*); the existence of a corporate social responsibility committee (*CSRCO*); leverage (*LEV*); firm size (*LNTA*); profitability (*OPFT*); risk (*RISK*); and sales growth (*SGR*). Table 1 fully defines all the variables used.

Table 6

Pearson's and Spearman's correlation matrices of the variables for all 500 firm years

Variable	CRDS	CRDI	BDIV	BOWN	BSIZE	GOWN	INED	IOWN	OPFT	BIG4	CAPX	CGCO	CLIST	CSRCO	LEV	LNTA	RISK	SGR	DBLS
CRDS		.758***	.124***	-.185***	.120***	.195***	.198***	-.116***	.080*	.317***	-.030	.389***	.475***	.418***	-.032	.234***	.186***	.037	.040
CRDI	.769***		.128***	-.192***	.147***	.149***	.105**	-.030	.262***	.330***	-.031	.520***	.193***	.216***	-.044	.168***	.194***	.088**	.029
BDIV	.118***	.110***		-.050	.430***	.126***	.138***	.052	-.109***	.111***	.077*	.009	-.047	-.049	.018	.366***	-.089**	.130***	.032
BOWN	-.130***	-.160***	-.036		-.028	-.273***	-.171***	.240***	-.055	.039	.112***	.011	-.065	-.076*	.089**	-.040	.114***	-.081**	-.050
BSIZE	.125***	.146***	.348***	-.009		.320***	.045	.162***	-.070*	.045	.128***	-.099**	.096**	.008	-.150***	.637***	-.060	.030	.026
GOWN	.169***	.180***	.073*	-.210***	.218***		.240***	.260***	.010	.008	.077*	.110***	.189***	.204***	-.307***	.530***	.090**	.056	.018
INED	.185***	.190***	.136***	-.147***	.009	.112***		.054	.046	-.067	-.020	.095**	.103**	.020	-.207***	.220***	.050	.099**	.030
IOWN	-.162***	-.048	.011	.370***	.135***	.197***	.060		-.194***	-.050	.131	-.029	-.040	-.059	.017	.200***	-.118***	.020	.042
OPFT	.080*	.225***	-.079*	-.108**	-.070*	.016	.079*	.288***		.056	-.079*	.227***	.140***	.220***	-.018	.030	.509***	-.017	.063
BIG4	.326***	.350***	.113***	.050	.085*	.040	-.060	-.017	.099**		.076*	.250***	.230***	.058	-.081*	.012	.035	-.008	.027
CAPX	-.010	-.044	.098**	.103**	.106**	.095**	-.040	.118***	-.062	.094**		.038	-.010	.031	-.125***	.304***	-.027	.049	-.011
CGCO	.380***	.529***	.020	.018	-.065	.070*	.096**	-.030	.201***	.249***	.048		.275***	.167***	-.199***	.040	.154***	.056	.048
CLIST	.440***	.218***	-.059	-.052	.080*	.163***	.108**	.015	.120***	.230***	.010	.274***		.326***	-.040	.211***	.109***	.040	.026
CSRCO	.374***	.210***	-.071*	-.060	.012	.138***	.030	-.088**	.220***	.056	.077**	.160***	.318***		.009	.195***	.184***	.057	.082*
LEV	-.039	-.045	.037	.078*	-.099**	-.135***	-.218***	-.012	-.015	-.060	-.152***	-.219***	.020	.017		-.240***	-.048	-.034	-.017
LNTA	.206***	.172***	.249**	-.070*	.605***	.409***	.232***	.167***	.010	.027	-.260***	.077*	.191***	.248***	-.220***		.040	.061	.038
RISK	.210***	.165***	-.078*	.106**	-.050	.084**	.020	-.215***	.630***	.063	-.047	.169***	.080*	.226***	-.040	-.009		-.053	.025
SGR	.040	.108**	.132***	-.089**	.110***	.064	.099**	-.008	.017	-.010	.116**	.088**	.025	.069	-.038	.150***	-.041		.034
DBLS	.047	.019	.026	-.040	.010	.052	.036	.051	.011	.029	-.018	.027	.044	.086*	-.032	.028	.040	.030	

Notes: The bottom left half of the table contains Pearson's parametric correlation coefficients, whereas the upper right half of the table shows Spearman's non-parametric correlation coefficients. ***, **, and * denote correlation is significant at the 1%, 5% and 10% level, respectively (two-tailed tests). Variables are defined as follows: total corporate risk disclosures based on sentence count (*CRDS*); total corporate risk disclosures based on a disclosure index (*CRDI*); board diversity on the basis of ethnicity and gender (*BDIV*); board size (*BSIZE*); block ownership (*BOWN*); government ownership (*GOWN*); independent non-executive directors (*INED*); institutional ownership (*IOWN*); profitability (*OPFT*); audit firm size (*BIG4*); capital expenditure (*CAPX*); the presence of a corporate governance committee (*CGCO*); cross-listing (*CLIST*); the presence of a corporate social responsibility committee (*CSRCO*); leverage (*LEV*); firm size (*LNTA*); risk (*RISK*); sales growth (*SGR*); and dual board leadership structure (*DBLS*). Table 1 fully defines all the variables used.

Table 7
The effects of corporate governance on corporate risk disclosure based on the quantity/volume measure (sentence count)

	Dependent variables							
Indep. variables (*Model*)	CRDS (1)	CFRDS (2)	CORDS (3)	CSRDS (4)	PRE-07/08 (5)	07/08 (6)	Post-07/08 (7)	Lagged(CRDS) (8)
Ownership variables:								
BOWN	-0.249***	-0.169***	-0.180***	-0.175***	-0.220***	-0.208***	-0.214***	-0.236***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GOWN	0.265***	0.172***	0.185***	0.196***	0.231***	0.210***	0.223***	0.254***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IOWN	-0.138**	-0.049	-0.060	-0.057	-0.084	-0.072	-0.077	-0.115*
	(0.037)	(0.280)	(0.250)	(0.264)	(0.210)	(0.238)	(0.226)	(0.068)
Board variables:								
BDIV	0.219***	0.160**	0.179***	0.168***	0.183***	0.172***	0.176***	0.195***
	(0.000)	(0.018)	(0.005)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)
BSIZE	0.125**	0.034	0.102*	0.045	0.076	0.057	0.063	0.115*
	(0.048)	(0.376)	(0.089)	(0.358)	(0.294)	(0.326)	(0.312)	(0.075)
DBLS	0.069	0.023	0.030	0.039	0.050	0.043	0.047	0.056
	(0.367)	(0.486)	(0.462)	(0.447)	(0.398)	(0.427)	(0.410)	(0.389)
INED	0.199***	0.157**	0.166**	0.150**	0.177***	0.168**	0.174**	0.183***
	(0.000)	(0.025)	(0.020)	(0.033)	(0.010)	(0.017)	(0.013)	(0.000)
Control variables:								
BIG4	0.210***	0.150**	0.169**	0.158**	0.183***	0.172***	0.178***	0.195***
	(0.000)	(0.030)	(0.020)	(0.025)	(0.000)	(0.010)	(0.005)	(0.000)
CAPX	-0.075	-0.022	-0.028	-0.033	-0.054	-0.044	-0.049	-0.060
	(0.342)	(0.467)	(0.452)	(0.436)	(0.380)	(0.396)	(0.413)	(0.364)
CGCO	0.258***	0.184***	0.197***	0.190***	0.225***	0.208***	0.219***	0.245***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)
CLIST	0.269***	0.210***	0.220***	0.215***	0.243***	0.230***	0.238***	0.252***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
CSRCO	0.185***	0.127**	0.136**	0.132**	0.169***	0.154**	0.160**	0.176***
	(0.000)	(0.039)	(0.028)	(0.034)	(0.008)	(0.019)	(0.013)	(0.000)
LEV	-0.126**	-0.008	-0.017	-0.012	-0.031	-0.023	-0.029	-0.119*
	(0.050)	(0.560)	(0.530)	(0.546)	(0.489)	(0.512)	(0.495)	(0.084)
LNTA	0.271***	0.176***	0.189***	0.180***	0.242***	0.225***	0.236***	0.260***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
OPFT	0.186***	0.123*	0.135**	0.129**	0.167***	0.146**	0.153**	0.175***
	(0.000)	(0.055)	(0.039)	(0.047)	(0.005)	(0.020)	(0.018)	(0.000)
RISK	0.248***	0.178***	0.186***	0.194***	0.223**	0.209***	0.217***	0.235***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SGR	0.064	0.009	0.015	0.020	0.044	0.030	0.040	0.056
	(0.376)	(0.476)	(0.460)	(0.451)	(0.425)	(0.440)	(0.432)	(0.390)
IND	Included	Included	Included	Included	Included	Included	Included	Included
YED	Included	Included	Included	Included	Included	Included	Included	Included
Constant	0.186	0.110	0.132	0.125	0.166	0.147	0.158	0.173
	(0.270)	(0.379)	(0.340)	(0.357)	(0.281)	(0.313)	(0.292)	(0.258)
Durbin-Watson	2.195	1.785	1.978	1.865	2.140	2.040	2.110	2.182
F-value	8.930***	4.956***	5.294***	5.180***	7.230***	6.496***	6.852***	8.425***
Adjusted R^2	0.426	0.360	0.373	0.365	0.380	0.371	0.376	0.397
N	500	500	500	500	250	100	150	450

Notes: P-values are in parentheses. Following Peterson (2009), the coefficients are estimated by using the robust *Clustered Standard Errors* technique along both year and industry dimensions. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively. Variables are defined as follows: total corporate risk disclosures based on sentence counts (*CRDS*); corporate financial risk disclosures based on sentence count (*CFRDS*); corporate operational risk disclosures based on sentence count (*CORDS*); corporate strategic risk disclosures based on sentence count (*CSRDS*); block ownership (*BOWN*), government ownership (*GOWN*), institutional ownership (*IOWN*); board diversity on the basis of ethnicity and gender (*BDIV*); board size (*BSIZE*); dual board leadership structure (*DBLS*); percentage of independent non-executive directors (*INED*); audit firm size (*BIG4*); capital expenditure (*CAPX*); the presence of a corporate governance committee (*CGCO*); cross-listing (*CLIST*); the presence of a corporate social responsibility committee (*CSRCO*); leverage (*LEV*); firm size (*LNTA*); profitability (*OPFT*); risk (*RISK*); sales growth (*SGR*); industry (*IND*); and year (*YED*). Table 1 fully defines all the variables used.

Table 8
The effects of corporate governance on corporate risk disclosure based on the quality/level measure (disclosure index)

	Dependent variables								
Indep. variables (*Model*)	CRDI (1)	CFRDI (2)	CORDI (3)	CSRDI (4)	PRE-07/08 (5)	07/08 (6)	Post-07/08 (7)	2SLS (8)	CRDI (9)
Ownership variables:									
BOWN	-0.240***	-0.172***	-0.186***	-0.179***	-0.229***	-0.210***	-0.218***	-0.252***	-0.235***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$BOWN^2$	-	-	-	-	-	-	-	-	-0.024
	-	-	-	-	-	-	-	-	(0.456)
GOWN	0.248***	0.169***	0.182***	0.190***	0.228***	0.206***	0.220***	0.260***	0.243***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
IOWN	-0.119*	-0.053	-0.065	-0.060	-0.089	-0.078	-0.080	-0.143**	-0.125**
	(0.060)	(0.272)	(0.243)	(0.256)	(0.198)	(0.225)	(0.213)	(0.030)	(0.048)
$IOWN^2$	-	-	-	-	-	-	-	-	-0.013
	-	-	-	-	-	-	-	-	(0.490)
Board variables:									
BDIV	0.199***	0.167**	0.184***	0.173***	0.186***	0.177***	0.182***	0.224***	0.194***
	(0.000)	(0.015)	(0.000)	(0.008)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BSIZE	0.119*	0.039	0.108*	0.052	0.080	0.060	0.073	0.137**	0.123**
	(0.070)	(0.367)	(0.080)	(0.346)	(0.285)	(0.317)	(0.296)	(0.040)	(0.049)
$BSIZE^2$	-	-	-	-	-	-	-	-	0.018
	-	-	-	-	-	-	-	-	(0.475)
DBLS	0.064	0.026	0.035	0.047	0.059	0.049	0.055	0.075	0.070
	(0.372)	(0.478)	(0.453)	(0.436)	(0.386)	(0.420)	(0.392)	(0.352)	(0.386)
INED	0.189***	0.160**	0.172**	0.155**	0.182***	0.173***	0.179***	0.210***	0.180***
	(0.000)	(0.020)	(0.016)	(0.024)	(0.009)	(0.010)	(0.013)	(0.000)	(0.000)
Control variables:									
BIG4	0.203***	0.158**	0.174**	0.165**	0.189***	0.178***	0.180***	0.219***	0.196***
	(0.000)	(0.025)	(0.016)	(0.020)	(0.000)	(0.006)	(0.002)	(0.000)	(0.000)
CAPX	-0.069	-0.027	-0.035	-0.038	-0.064	-0.053	-0.058	-0.080	-0.064
	(0.350)	(0.460)	(0.440)	(0.430)	(0.372)	(0.386)	(0.397)	(0.329)	(0.358)
CGCO	0.252***	0.189***	0.203***	0.196***	0.230***	0.212***	0.224***	0.265***	0.245***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)
CLIST	0.258***	0.219***	0.227***	0.220***	0.249***	0.238***	0.244***	0.275***	0.250***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CSRCO	0.180***	0.132**	0.144**	0.139**	0.175***	0.167**	0.176***	0.194***	0.176***
	(0.000)	(0.030)	(0.022)	(0.027)	(0.002)	(0.011)	(0.005)	(0.000)	(0.000)
LEV	-0.125*	-0.016	-0.024	-0.018	-0.039	-0.028	-0.036	-0.135**	-0.120*
	(0.063)	(0.549)	(0.521)	(0.538)	(0.480)	(0.500)	(0.485)	(0.042)	(0.068)
LNTA	0.265***	0.180***	0.194***	0.187***	0.250***	0.230***	0.240***	0.283***	0.260***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
OPFT	0.180***	0.127**	0.142**	0.134**	0.175***	0.151**	0.159**	0.192***	0.174***
	(0.000)	(0.050)	(0.031)	(0.040)	(0.000)	(0.017)	(0.011)	(0.000)	(0.000)
RISK	0.242***	0.183***	0.191***	0.199***	0.228**	0.213***	0.222***	0.253***	0.238***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SGR	0.065	0.017	0.020	0.025	0.049	0.038	0.045	0.075	0.060
	(0.381)	(0.462)	(0.454)	(0.446)	(0.420)	(0.432)	(0.426)	(0.360)	(0.393)
IND	Included	Included	Included	Included	Included	Included	Included	Included	Included
YED	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	0.180	0.119	0.138	0.130	0.175	0.156	0.167	0.194	0.185
	(0.262)	(0.370)	(0.334)	(0.342)	(0.268)	(0.295)	(0.279)	(0.240)	(0.246)
Durbin-W.	2.194	1.865	2.006	1.967	2.153	2.089	2.164	2.210	2.197
F-value	8.639***	5.047***	5.394***	5.769***	7.895***	6.874***	7.210***	9.025***	8.732***
Adjusted R^2	0.408	0.369	0.380	0.371	0.386	0.378	0.385	0.434	0.419
N	500	500	500	500	250	100	150	500	500

Notes: P-values are in parentheses. Following Peterson (2009), the coefficients are estimated by using the robust *Clustered Standard Errors* technique along both year and industry dimensions. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively. Variables are defined as follows: total corporate risk disclosures based on the disclosure index (*CRDI*); corporate financial risk disclosures based on the disclosure index (*CFRDI*); corporate operational risk disclosures based on the disclosure index (*CORDI*); corporate strategic risk disclosures based on the disclosure index (*CSRDI*); block ownership (*BOWN*), government ownership (*GOWN*), institutional ownership (*IOWN*); board diversity on the basis of ethnicity and gender (*BDIV*); board size (*BSIZE*); dual board leadership structure (*DBLS*); percentage of independent non-executive directors (*INED*); audit firm size (*BIG4*); capital expenditure (*CAPX*); the presence of a corporate governance committee (*CGCO*); cross-listing (*CLIST*); the presence of a corporate social responsibility committee (*CSRCO*); leverage (*LEV*); firm size (*LNTA*); profitability (*OPFT*); risk (*RISK*); sales growth (*SGR*); industry (*IND*); and year (*YED*). Table 1 fully defines all the variables used.