

Corporate Governance Structure and Risk Disclosures: Insight from Canada in Times of Crisis

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Abstract: In this study, the relationship between corporate governance structure and the level of corporate risk disclosure (CRD) in oil and gas businesses listed in Canada during tumultuous times is examined. There were 224 firm-year observations from the study's 56 firms, which were chosen based on the information that was available throughout the four-year period from 2006 to 2009. Although CRD has information, the primary drivers may act or behave differently during turbulent times. The study used multiple linear regression to find CRD is negatively correlated with block share ownership, positively correlated with board gender diversity and a weaker correlation with board size. However, government ownership, institutional ownership and board independence were not significantly related to the level of CRD.

Keywords: Corporate Governance Structure, Corporate Risk Disclosure, Oil and Gas, Financial Crisis, Board of Directors

1. INTRODUCTION

The interdependence of corporate governance, corporate risk management, and aspects of business transactions emphasises the significance of the reciprocal influence of corporate governance on total risk management disclosures and tactics. In addition to providing incentives that are adequate and guide the

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board and top management team in the pursuit of goals aligned with the best interests of several stakeholders, but principally those of the company and its shareholders, acknowledging risks, corporate governance guarantees that businesses can be held responsible for their actions (Ntim *et al.*, 2013). Risk has strategic implications for sustaining long-term sustainable company operations (Lajili, 2009) and is defined as the uncertainty of events with unknown probability distributions (Cabedo & Tirado, 2004).

The main goals of corporate risk management are to determine what can go wrong, assess which risks need to be addressed, and put those solutions into action (Ntim *et al.*, 2013). The board of directors is in charge of comprehending and approving management's procedures for controlling the company's risk, which makes it a crucial player in risk governance and management (Viscelli *et al.*, 2016).

The board of directors and senior managers make judgements on risk appetite, acceptable risk, and whether or not to share this information. This study is interested in exploring if the usual relations between the corporate governance structure and corporate risk disclosures are maintained in times of financial crisis that also affect developed countries as a departure from emerging economies where the impact of macroeconomic instability has been measured (Ntim, 2016).

The association between corporate governance frameworks and corporate risk disclosures (CRD) during a serious financial crisis is the main subject of this study. Referred to as "the greatest crisis in the history of finance capitalism," the 2007–2008 financial crisis has been characterised as the worst catastrophe since the Great Depression and Wall Street Crash of the late 1920s and 1930s (Ashby, 2009). The crisis's causes include inadequate corporate governance and risk cultures, managerial risk perception, gaps in organisations' risk appetite frameworks, and a lack of CRD. The discussion of good corporate governance through risk management and reporting techniques ranges from managers' lack of rewards to their voluntary participation in CRD (Vieira da Silva *et al.*, 2011) to strategic reasons to demonstrate CRD (Lajili, 2009). Most studies were based on banks and financial institutions (Martins Rodrigues *et al.*, 2014); therefore, to extend the existing literature this study provides data on a very particular niche where corporate governance structure, CRDs, and companies in the oil and gas industry in a developed country intersect in times of crisis

complementing Ntim *et al.* (2013) study with South African companies. This study focuses on Canadian companies because previous studies have shown that business cycles in Canada and the US are highly correlated (Vatsa, 2021), so results obtained in Canadian companies can be extrapolated to US companies, particularly in the oil and gas industry.

The purpose of this exploratory study is to add to the body of knowledge regarding how corporate governance structure characteristics affect CRD. Analysis of data gathered over four years from 56 Canadian oil and gas businesses reveals that CRD is positively impacted by firm size, leverage, performance, and board gender diversity. On the other hand, CRD is not greatly impacted by institutional ownership, government ownership, board size, or board independence. Block ownership has a markedly detrimental impact on CRD, indicating to regulators that CRD is hampered by ownership concentration. The concisely arranged body of current literature aids in comprehending the impact of CRD drivers, notwithstanding the exploratory nature and narrow scope of this investigation (Lajili & Zeghal, 2005). Second, it explores CRD by counting the times risk words were used during the financial crisis (from 2006 to 2009), suggesting distinctive preliminary empirical insights. Third, it specifically examines the relationship between the company's corporate governance structure ownership and board with its CRD (i.e. use of risk-related words in the annual reports released to the public), departing from previous research focused on the impact of certain features on CRD, the most frequently tested features are size and industry. This paper has five sections, with the next examining explanations of CRD and its drivers rooted in diverse theoretical perspectives (Amran *et al.*, 2009), including agency, resource dependency, institutional and legitimacy, and stakeholder theories. The third section focuses on research decisions explaining the selection of firms, years, and the operationalisation of variables. Section four presents the results with the descriptive statistics and regression models, followed by the discussion and conclusion.

2. THEORETICAL FRAMEWORK

Companies participate in voluntary CRD for a variety of reasons; the literature identifies four hypotheses that examine the connection between voluntary CRD and corporate governance (Ntim *et al.*, 2012; Ntim,

2016). In summary, agency theory contends that CRD lessens information asymmetry among various investors (Rhodes & Soobaroyen, 2010), but it primarily targets opportunistic financial agents (Abraham & Cox, 2007). This facilitates effective evaluation of the risk profiles of the institutions by all interested parties involved in investment decisions (Elshandidy & Neri, 2015; Miihkinen, 2013). Resource dependence theory is another theoretical approach extensively used arguing that firms are purposefully connected with external factors by top managers with the aim to co-opt the resources needed to survive while developing a competitive advantage by committing to high levels of CRD (Ntim *et al.*, 2012) despite CRD being expensive (Lajili & Zeghal, 2005) it does not affect the cost of capital (Vieira da Silva *et al.*, 2011). Though it has been criticised for prioritising financial stakeholders and its limited ability to predict and explain managerial behaviour (Deegan, 2002), legitimacy theory, which is closely related to institutional theory, contends that firms can legitimise their operations and gain social acceptance by participating in CRD (Chen & Roberts, 2010; Mousa & Elamir, 2013; Ntim *et al.*, 2012). The final theoretical lens is stakeholder theory (Freeman, 1984), which has been criticised for focussing on stockholders who normally are depicted as wealthy and powerful in financial terms and for linking self-interests, both of the corporation and top managers, to CDR (Deegan, 2002). However, it does assist in identifying stakeholders who enhance the firm's perceived legitimacy (Ntim *et al.*, 2012).

Although theoretical approaches are generalizable, this study places corporate governance and CRD within the Canadian legal context. Professional and stakeholder associations such as the Institute of Corporate Directors affect Canadian corporate governance practices on top of legal rules and influences of institutional shareholder and the media, Canada is a confederation with jurisdictions under Common Law and one under Civil Law, therefore there are several sources of legislation (regulatory statutes, regulations and policies) governing corporate governance such as provincial corporate statutes, securities laws and rulings, stock exchanges and the securities exchange commission requirements. With 50 organisations holding more than \$3 trillion in assets, the Canadian Coalition for Good Governance (CCGG) is the country's leading corporate governance group and is ideally positioned to represent institutional investors in Canadian public stocks. Directors must debate whether the board

takes on the duty of identifying the primary risks that impact the company and making sure that the appropriate mechanisms are in place to manage these risks in accordance with the Toronto Stock Exchange's principles for sound corporate governance.

Disclosure requirements ask directors to identify and describe the principal risks faced by the company and discuss the structures and procedures in place to manage those risks. Securities exchange regulators in Canada require CRDs to be included in Annual Reports, specifically in the Management Discussion and Analysis (MD&A) section; a similar requirement appears in the Canadian Institute of Chartered Accountants (CICA) Handbook (Section 3860). Canadian regulators encourage forward-looking information, but do not mandate them while details about market risk and other forward looking information must be disclosed in quantitative and qualitative terms (see FRR No. 48) in the US as per the Securities and Exchange Commission (SEC). Although CRD disclosures allow management discretion, they are governed by decisions around "materiality" and "significant risk exposure".

2.1. Hypotheses Development

Several constructs affect CRD, such as corporate governance, corporate social responsibility, voluntary disclosure, corporate setting, government ownership, block share ownership, institutional share ownership, board diversity, board size, board independence, firm size, firm performance, and firm leverage (Ntim & Soobaroyen, 2012; Ntim, 2016). We test six hypotheses following prior research and using available data (Lajili & Zeghal, 2005; Ntim *et al.*, 2012; Ntim, 2016).

Government ownership has been said to increase agency problems because it protects organizations from inspection and sanctioning by regulatory authorities increasing the propensity of fraudulent behaviors and corruption (Hou & Moore, 2010). However, when corruption is removed, conflicts among stakeholders are minimized with increased disclosure, including CRD (Eng & Mak, 2003). According to stakeholder theory, Canadian companies with high government ownership are expected to actively seek government support (Freeman, 1984; Freeman & Reed, 1983) by complying with regulations suggesting that government ownership is likely to be an important driver of CRD in Canadian companies. However, in the Oil and Gas sector, government ownership as of 2015 was estimated to be at the 2% mark (Caroll & Huijzer,

2018), diluting the relationship. Prior literature offers mixed results, with Eng & Mak (2003), Khan *et al.* (2013), and Ntim and Soobaroyen (2012) finding a positive association between government ownership and voluntary disclosure, and Dam and Scholtens (2012) reporting that government ownership is negatively associated with voluntary disclosure. Based on the above, this study hypothesizes that:

H1. CRD extent is positively associated with government ownership

Because of the accompanying costs of litigation, regulation, and competition, managers avoid CRD when agency difficulties are minimised and information asymmetry associated with concentrated or block ownership is decreased (Ntim *et al.*, 2013). In the case of family-owned businesses, where concentrated ownership results in less voluntary disclosure, CRD is minimised to protect it from external stakeholders (Eng & Mak, 2003; Khan *et al.*, 2013). Prior research findings primarily support the idea that, in contrast to the distributed alternative, concentrated ownership arrangements result in lower voluntary disclosure levels (Eng & Mak, 2003; Barako *et al.*, 2006). The same is expected to be observed in Canada, where corporate business structure block ownership is likely to be an important driver of CRD as reflected in our second hypothesis:

H2. CRD extent is negatively associated with block ownership

Managers are required to disclose more in order to justify their ongoing stewardship of the company and its resources (Chen & Roberts, 2010), and institutional ownerships have an additional motivation to keep a close eye on corporate disclosures (Abraham & Cox, 2007). Institutional shareholders are assigned watchdogs who make investments on behalf of other people, such pensioners or employees, and they have a keen interest in the corporate governance, disclosures, and performance of the business (Saggar & Singh, 2017). Institutional ownership and voluntary disclosure have been positively correlated in a number of research (Ntim *et al.*, 2012; Barako *et al.*, 2006), although there has also been no correlation observed in other studies (Saggar & Singh, 2017). However, there are few studies focused in the oil and gas industry that explored the correlation of CDR with institutional ownership. In Canada, institutional ownership in Oil and Gas companies is important (Carroll & Huijzer, 2018); therefore, our third hypothesis is:

H3. CRD extent is positively associated with institutional ownership

Female board directors enhance gender diversity (Saggar & Singh, 2017; Saggar *et al.*, 2021; Mahadeo *et al.*, 2011) which in turn enhance board independence, helps with more critical monitoring of top management and improve connections with other stakeholders resulting in growth and innovation (Cabedo & Tirado, 2004). Empirical studies show a positive effect of gender diversity on several corporate outcomes (Ntim *et al.*, 2013), including Corporate Social Responsibility (CSR) reporting and financial performance, and voluntary disclosure (Barako & Brown, 2008). The same effect is expected in Canadian oil and gas companies, as reflected in the next hypothesis:

H4. CRD extent is positively associated with gender diversity.

Because of its diverse skills and experience, managerial monitoring linked to additional board members is expected to positively impact the company's performance and boosts corporate disclosures such as CRD (Hou & Moore, 2010). Larger boards offer superior access to the external environment assisting to secure resources, such as finance and business contracts (Jia *et al.*, 2009). Research also argues that larger boards are ineffective (Jensen & Meckling, 1976; Hou & Moore, 2010) or show no impact despite their diversified knowledge and expertise (Saggar & Singh, 2017; Saggar *et al.*, 2021). Although is documented that more information is disclosed by firms with larger boards (Ntim *et al.*, 2012), particularly CRD (Elzahar & Hussainey, 2012). We hypothesise that in Canadian oil and gas firms, board size drives the extent of CRD:

H5. CRD extent is positively associated with board size

Companies with a higher percentage of independent directors tend to have more voluntary disclosures (Freeman & Reed, 1983; Ntim *et al.*, 2013). Independent and non-executive directors provide the necessary supervision to improve the effectiveness of the board in advising, monitoring, and disciplining managers (Saggar & Singh, 2017). Although some studies show linkages between non-executive members and CRD, others failed to find an effect (Wan Mohamad & Sulong, 2010). Conflicting results might be explained by the difference between the reported board independence and the true board independence that considers independent directors' links

with majority shareholders. In Canada, the role of the Board Chair should be separate from that of the CEO, and this independence, in turn, enhances CRD as is hypothesized here:

H6. CRD extent is positively associated with board independence

3. RESEARCH DESIGN AND METHOD

There are 224 firm-year observations in the sample, which consists of all 56 oil and gas businesses listed on the Toronto Stock Exchange (TSX) between 2006 and 2009 (before to, during, and following the financial crisis). The annual reports of the selected companies that were retrieved from SEDAR were used to gather the corporate governance and CRD variables. On the other hand, SEDAR and corporate websites were used to gather the financial data, and Adobe Reader was used to convert the PDF files into Microsoft Word.

To find out how many terms connected to risk were used, a word count was done. Content analysis and a count of risk-related terms were used to create the variable “extent of CRD.” “Catastrophe” (“catastrophic”), “challenge” (“challenges”), “chance” (“chances”), “decline” (“declined”), “decrease” (“decreased”), “differ”, “diversify”, “fail” (“failure”), “fluctuate”, “gain” (“gains”), “high”, “increase” (“increased”), “less”, “loss”, “low”, “peak” (“peaked”), “probable”, “reverse” (“reversed”), “risk”, “significant”, “shortage”, “threat”, “unable”, “uncertain” (“uncertainty”, “uncertainties”), and “viable” were the words used to construct the CRD scores for each company/year (Elshandidy & Neri, 2015). The content analysis generated aggregate CRD scores for each company from 2006 to 2009, where the effects of a banking crisis are normally felt at least one year before (2006) and one year after (2009).

3.1. Definition of Variables and Model Specification

Using multiple regression, the study analyzes how board and ownership characteristics affect the extent of CRD. It also controls for the effect of a set of variables used in the literature, such as size, performance, and leverage (Elshandidy *et al.*, 2013; Ntim *et al.*, 2013; Elshandidy and Neri, 2015). Previous studies have suggested that the extent of CRDs and size may be positively correlated, with larger firms showing more incentives to reveal more information to save agency related costs (Adamu, 2013). Lajili and Zeghal (2005) claim a negative correlation between profitability and CRD, however

Mohobbot (2005) and Miihkinen (2013) show a favourable correlation. Leveraged firms have higher agency costs, and corporate disclosure increases with leverage (Jensen & Meckling, 1976; Mahadeo et al., 2011). The regression model using ordinary least squares (OLS) is specified as follows, with Table 1 showing how each construct has been operationalized:

$$\text{CRD} = \beta_0 + \beta_1 \text{GOWN} + \beta_2 \text{BOWN} + \beta_3 \text{IOWN} + \beta_4 \text{BDIV} + \beta_5 \text{BSIZE} + \beta_6 \text{BIND} + \beta_7 \text{FS} + \beta_8 \text{FP} + \beta_9 \text{FL} + \varepsilon$$

Table 1: Variable Definition

<i>Variable</i>	<i>Name</i>	<i>Definition and Operationalization</i>
Dependent Variable		
CDR	Risk Disclosure	CRD is the total Corporate Risk Disclosure. It measures the extent (in terms of word count) of CRD mentions or specific word usage in corporate annual reports that inform the reader about any opportunity, hazard, danger, harm, threat, or exposure that has impacted or may impact the company in the future (Saggar & Singh, 2017).
Independent Variables: ownership and board characteristics		
GOWN	Government Ownership	GOWN is the percentage of government ownership to total company ordinary shareholdings (Ntim <i>et al.</i> , 2013).
BOWN	Block Ownership	BOWN is the percentage of ordinary shares held by block shareholders, where block is to have over 5% holdings (Ntim <i>et al.</i> , 2013).
IOWN	Institutional Ownership	IOWN is the percentage of ordinary shares held by institutional shareholders (Ntim <i>et al.</i> , 2013).
BDIV	Board Diversity	BDIV is the percentage of female directors to the total number of directors on the board of a company (Ntim <i>et al.</i> , 2013).
BSIZE	Board Size	BSIZE is the total number of directors on the board of a company (Fodio <i>et al.</i> , 2013).
BIND	Board Independence	BIND is the percentage of independent non-executive directors to the total number of directors on the board of a company (Fodio <i>et al.</i> , 2013).
Control Variables		
FS	Firm Size	FS Firm Size is determined by company's natural logarithm of year end total assets expressed in millions (Waweru & Riro, 2013)
FP	Firm Performance	FP Firm Performance is measured by dividing company's EBIT (Net Income before Interest and Tax) by average total assets expressed in millions (Waweru, 2012)
FL	Firm Leverage	FL Firm Leverage is measured by dividing company's non-current liabilities (Total Liabilities minus current Liabilities) by average owners' equity expressed in million. (Waweru & Riro, 2013)

4. RESULTS

4.1. Descriptive Results

Descriptive statistics are presented in Table 2. A count of CRD shows an average of 593 related words were included in annual reports, with a minimum of 364 and a maximum of 858. The minimum of our sample is close to the 288 observed by Saggar *et al.* (2021), but the maximum of 858 is higher despite both studies counting the same risk-related words. The average government ownership is 3.8% suggesting that governments have little control. The mean block share ownership of 9.4% suggests a highly dispersed shareholding (low ownership concentration). On average institutional investors control only 14% of Canadian oil and gas companies. There are few female directors reporting a low mean of 9.2%, although one company reaches the maximum of 50%. The average board size is almost 7, while the maximum board size is 13, well below the threshold for ineffective larger boards. Independent directors represent 53%, suggesting that most listed oil and gas company boards are independent. The mean of performance is 3.3% which is considered low and captures the impact of the financial crisis in this particular industry.

Table 2: Descriptive Statistics

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev</i>	<i>Min</i>	<i>Max</i>
Risk Disclosure	224	593.35	95.4234	364	858
Government Ownership	224	3.8%	0.0518	0	0.24
Block Ownership	224	9.4%	0.0513	0.002	0.23
Institutional Ownership	224	14%	0.1687	0.01	0.72
Board Gender Diversity	224	11%	0.1216	0	0.5
Board Size	224	6.675	2.3989	3	13
Board Independence	224	53%	0.1767	0	0.833
Firm Size	224	20.87	1.5329	17	25
Firm Performance	224	3.3%	0.0216	0.0049706	0.176
Firm Leverage	224	21%	0.1367	0.02	0.62

Multicollinearity and normality are basic requirements to perform OLS regressions, hence they were inspected for problems. Pearson correlations between independent variables are detailed in Table 3 and show they are all well below the benchmark of 0.7 (Gujarati & Porter, 2009). Thus, multicollinearity does not appear to be an issue. As an extra multicollinearity test, we also calculated

Table 3: Pearson Correlations Matrix

	<i>CDR</i>	<i>GOWN</i>	<i>BOWN</i>	<i>IOWN</i>	<i>BDIV</i>	<i>BFSIZE</i>	<i>BIND</i>	<i>FS</i>	<i>FP</i>
Risk Disclosure	1.0000								
Government Ownership	0.2237	1.0000							
Block Ownership	-0.2618	-0.4235	1.0000						
Institutional Ownership	0.2092	0.5853	-0.4252	1.0000					
Board Gender Diversity	0.2003	0.1740	-0.3854	0.2199	1.0000				
Board Size	0.0545	0.3557	-0.4437	0.2933	0.2104	1.0000			
Board Independence	0.0116	0.2009	-0.3363	0.1156	0.0841	0.5944	1.0000		
Firm Size	0.1761	0.5083	-0.4801	0.4452	0.0522	0.5747	0.4990	1.0000	
Firm Performance	0.1249	-0.0090	0.0352	0.0650	-0.1845	-0.0995	-0.1292	-0.0943	1.0000
Firm Leverage	0.1253	-0.1325	0.0989	-0.0777	0.1277	-0.2153	-0.2858	-0.4327	0.1173
VIFs	1.6000	1.2452	2.0109	1.3768	2.0017	1.1072	1.8341	1.9325	1.7532

the VIFs. According to our findings, every VIF falls short of the standard of 5 (Gujarati & Porter, 2009). Cook's distances, studentized residuals, scatter plots for P-P and Q-Q, and Durbin-Watson statistics for homoscedasticity, linearity, normality, and autocorrelation, respectively, were also examined (for brevity, not reported here, but available upon request). The tests showed no significant violations of these OLS assumptions.

4.2. Regression Models and Discussion

The multiple regression results of Table 4 have significant explanatory power although not all variables are relevant. Both models present the results of CRD as the dependent variable of various corporate governance mechanisms, but only Model 2 includes the control variables. The adjusted R² of model 1 is 10.9% and 16.3% in model 2. A significant negative relationship between Block Ownership and CRD is observed in both models, thus supporting our second hypothesis (H₂). The findings show that an increase in block ownership leads to a decrease in CRD. These results are consistent with those of Ntim *et al.* (2013), Eng and Mak (2003) and Khan *et al.* (2013), who find less disclosure in firms with concentrated ownership due to the low levels of outsider interest and public accountability. Hence CRD associated costs make firms with concentrated ownership less likely to offer extensive or detailed disclosures.

Table 4: Regression Results

<i>Risk Disclosure</i>	<i>Model 1</i>			<i>Model 2</i>		
	<i>Coef.</i>	<i>P>t</i>	<i>t</i>	<i>Coef.</i>	<i>P>t</i>	<i>t</i>
Government Ownership	238.2631	0.164	01.40	176.2083	0.313	1.01
Block Ownership	-360.6466	0.019	-2.37**	-268.7723	0.018	-2.56**
Institutional Ownership	33.13586	0.501	0.67	1.38675	0.979	0.03
Board Gender Diversity	89.14717	0.027	2.33**	118.06	0.022	2.45**
Board Size	-3.791542	0.093	-1.12*	-5.516214	0.081	-1.75*
Board Independence	-21.20979	0.608	-0.51	-19.30368	0.644	-0.46
Firm Size				14.79365	0.008	2.66***
Firm Performance				623.3886	0.010	2.59***
Firm Leverage				125.2609	0.013	2.51**
Constant	639.4816	0.000	20.06	288.9143	0.020	2.34**
R- Squared	0.1091			0.1639		
F - Statistics	0.1025***			0.1203***		

*significant at the 10%, ** significant at the 5%, *** significant at the 1%

Thus, the concentration of ownership does not pressure oil and gas companies to convey extra information to investors in their annual reports.

Concentration of ownership is important, but not all three forms are relevant for the oil and gas industry in Canada. We argued that government, block and institutional owners can do ownership concentration. When analyzing industrial sectors, if one of the three is more prevalent than the others, then a crowd-out effect might be occurring. Factors such as industry and country might influence which of the three has more pre-eminence. Previous research shows a consistent and significant negative relationship between institutional ownership with female directors and performance in Indonesia (Natalia & Isnalita, 2024), suggesting it is a relation that occurs in both developed and emerging economies. When using data from Oil and Gas companies listed in Canada, we observe a moderately strong positive correlation between Institutional and Government ownership, but both are negatively correlated with Block Ownership.

The study found a significant relationship between board gender diversity and CRD in both models of table 4, where gender-diverse boards have more extensive CRDs, providing support for our fourth hypothesis (H_4). These results are consistent with existing literature (Ntim *et al.*, 2013; Khandelwal *et al.*, 2020; Saggarr *et al.*, 2021), indicating that board diversity has a positive relationship with voluntary disclosure. Results show that there is more CSR reporting in firms with more diverse boards (Ntim *et al.*, 2012), and that board gender diversity relates positively with performance while it relates non-significative but negative with leverage in Indonesian firms (Natalia & Isnalita, 2024). Literature shows that gender diverse boards are corelated with better financial performance, and although it has not been tested, our data shows a negative correlation of board gender diversity, independence and size with company's performance; maybe this reflects the effect of the 2006 to 2009 financial crisis.

Since our research indicates that there is no substantial correlation between government ownership and CRD, our first hypothesis (H_1) is not validated. These findings contradict those of Freeman and Reed (1983) and Ntim *et al.* (2013) because they do not corroborate the claim that government-owned Canadian businesses actively work to gain government support as a significant stakeholder (Freeman, 1984; Freeman & Reed, 1983). Instead, the explanation

is based on the government's negligible ownership of the industry (less than 4% over the previous 20 years). These results also point out the impact of the financial crisis on the industry, where government ownership and firm performance show a negative correlation.

The results indicate an insignificant relationship between institutional ownership and CRD. Our third hypothesis (H_3) is not supported. These results are inconsistent with studies conducted by Saggrar and Singh (2017), which identify the main objective of institutional investors is to create value for shareholders, and therefore, company performance, disclosures and corporate governance are of paramount importance. There is literature showing positive links between extensive voluntary disclosure and institutional ownership (Ntim *et al.*, 2012; Barako *et al.*, 2006) but there is also literature more aligned with this study's results of not documenting a significant effect of institutional ownership on disclosure (Saggar & Singh, 2017). We suggest a crowd out effect might be at play, where Block Ownership is the only type of ownership concentration in the Oil and Gas Industry in Canada that affects CRD.

Our fifth hypothesis (H_5) on the correlation between board size and CDR, is not supported. Results show an insignificant negative relationship between board size and CRD in similar terms to Saggar *et al.* (2021). These results agree with part of the literature (Khandelwal *et al.*, 2020) but are inconsistent with others finding that larger boards disclose more information on their corporate governance and CSR practices, hinting a positive effect of board size on CRD (Ntim *et al.*, 2012). However, Jensen and Meckling (1976) view that larger boards are ineffective at corporate performance and disclosure and that smaller boards are more effective since they limit free ridings and allow for better communication, coordination and monitoring, all of which can have a negative impact on CRD. Both Models in table 4 show a negative coefficient significant at 10%, suggesting that in this sample, agency theory predictions are more suitable. Agency theory is a product of North America; therefore, confirming its predictions with data from a traditional industry in Canada makes sense. Ntim *et al.* (2012) study is based on a different context where the tenets of agency theory might not be as salient as observed in the oil and gas industry of Canada.

Our study found no significant relationship between board independence and CRD. Therefore, our sixth hypothesis (H_6) is not supported, which is

consistent with Saggar *et al.* (2021) results with the proxy for board independence they use, which is CEO duality, but partially in disagreement with Khandelwal *et al.* (2020) that found a positive association with CRD. While most studies show a direct link between CRD and board directors' independence within developed countries, the relationship is weak in oil and gas companies. This may be largely due to a lack of rotation among directors and the presence of executives sitting on the boards. However, individual characteristics such as CEO age (Ozbek, 2020) or board member industry experience (Ozbek, 2021) might influence performance when combined with board independence, deserving a more granular analysis. Our results agree with part of the literature that fails to observe a clear link or correlation between independent board directors and voluntary disclosure (Mohamad & Sulong, 2010). We argue that this is observed in our study because of the period selected, where the financial crisis produces a negative correlation between board independence and firm performance.

Regarding the control variables added in model 2 of Table 4, we found that the relationship between firm size and CRD is positive and significant. Companies that are larger are more likely to provide more disclosure risk. Based on the potential for economies of scale, Saggar *et al.* (2021) asserted that there is a positive and significant correlation between size and disclosure. These findings are in line with their research (Solomon & Solomon, 2000). According to research by Watson *et al.* (2002), larger companies can give voluntary disclosures at a far lower cost than smaller companies. The cost of compiling and then sharing the information is one of the direct expenses that would be incurred through voluntary disclosure; an indirect cost of this activity could be a loss of competitive advantage (Solomon & Solomon, 2000).

The results show a significant relationship between firm performance and CRD. The coefficient is positive, which implies that an increase in the performance of a firm will increase the likelihood of CRD because only companies with good performance can invest the extra resources required for CRD. The results of this study agree with part of the literature that argue that firms with better profitability tend to companies that are better at risk management will have a higher level of relative profitability through signalling their risk management abilities to the market via disclosure in the annual reports. However, these results are in the opposite direction of Saggar *et al.*

(2021), who found a negative relation, arguing that bad performance led companies to disclose more to avoid litigation or with Vieira da Silva *et al.* (2011) results that found no impact of CRD on capital market risk. Here is where we best observe the anomaly of these years of crisis. Previous studies had strong positive correlations between the three control variables (size, performance and leverage), but our study shows in table 3 such a positive correlation only between performance and leverage, with a negative relation of size with profitability and leverage, suggesting larger firms were affected more by the crisis as partially documented by Martins Rodrigues *et al.* (2014).

Lastly, we discovered a strong correlation between leverage and CRD. Firms with high levels of debt are more likely to disclose risk, according to the positive coefficient. While Dobler *et al.* (2011) discovered a negative correlation between firm leverage and CRD, Deumes and Knechel (2008), Miihkinen (2013), and Elshandidy *et al.* (2013) concluded that a firm's leverage had a positive and significant impact on the level of CRD. However, several research have revealed a negligible association (Mohobbot, 2005; Abraham & Cox, 2007; Amran *et al.*, 2009; Ntim *et al.*, 2013; Adamu, 2013; Elshandidy & Neri, 2015).

5. CONCLUSION, IMPLICATIONS, FUTURE RESEARCH AND LIMITATIONS OF THE STUDY

5.1. Conclusion and Implications

Corporate governance practices are now under more scrutiny as a result of the global financial crisis. This paper's primary goal was to examine how corporate governance practices and CRD relate to Canadian oil and gas firms amid a financial crisis. The study uses 224 observations from a total of 56 firms over four years. The results show that CRD is significantly positively impacted by board gender diversity, business size, leverage, and performance. On the other hand, board independence, institutional ownership, and government ownership have little effect on CRD, while board size has a slight adverse effect.

Block ownership has a significantly negative effect on CRD, and this has implications for regulatory bodies, which may consider making mandatory changes rather than encouraging corporate governance norms with respect to board characteristics and keep a check on ownership concentration for

improving CRD by companies with shareholders holding large percentages of ownership. Therefore, more needs to be done by market regulators to protect the rights of minority shareholders (Waweru & Riro, 2013).

5.2. Direction for Future Research

This study contributes to understanding the effect of corporate governance drivers on CRD seen from various theoretical lenses. Although we find that agency and resource dependency theories have some explanatory power in Canada's oil and gas industry, seems evident that differences between theories and their predictive ability depend on the industry, country and time (Saggar *et al.*, 2021). Extensions of this study include replications in the same industry of other countries in periods of crisis and longer periods of stability to enhance the external validity of our findings. Future research could include lag measures that can shed some light on causality, going beyond the correlations that dominate the current literature. Finally, more granular longitudinal and qualitative studies can fine tune the understanding of CRD as a cause or effect of corporate governance structure.

5.3. Limitations of the Study

Despite the policy and theoretical contributions, the study presents several limitations. Firstly, although the expected direction of causality is from corporate governance to CRD, the study cannot exclude the reverse relationship. Second, the extent of information available to investors in the annual report may not fully outline a complete understanding of corporate governance mechanisms. Moreover, our study is constrained to listed companies operating in a developed country, Canada. Firms in developed countries may differ from those operating in emerging economies, where more research is needed.

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Conflict of interest

There is no conflict of interests involved in the publication of this article.

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