

# Value Relevance of Climate Change Disclosure: An Empirical Study on The Oil & Gas Companies Listed on Toronto Stock Exchange (TSX)

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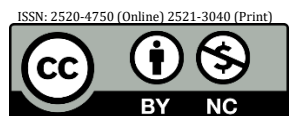
## Abstract

This study looks at how important it is for oil and gas companies which are listed on the Toronto Stock Exchange (TSX) to disclose information on climate change. I create a disclosure index by doing a content analysis of 58 firms' publicly accessible documents. As an independent variable, the Disclosure Index Score derived from the content analysis of 58 corporations is taken into consideration. As a stand-in for business value, the market to book assets ratio is employed. The relationship between corporate value and the degree of climate change disclosure is investigated in this study. According to empirical data, investors weigh how much information has been disclosed on climate change when determining a company's market value. Because it looks at the connection between climate change declarations and businesses' value, this study adds to the body of knowledge in environmental accounting. Practically speaking, the results of this investigation will give the Canadian Securities Administrator (CSA) an understanding of how disclosures about climate change are made and give them a framework for drafting associated disclosure requirements. Additionally, it should motivate Canadian oil and gas corporations to reveal their GHG emission reduction plans and strategies.



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**Keywords:** *Climate Change Disclosures, GHG emissions, Disclosure Index, Oil and Gas, Firm value, Value Relevance.*

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## 1. Introduction

One of the major concerns for the world now is climate change. Fossil fuels are the major reason for global climate change. Emission of GHG leads to global warming and climate change. Severe negative impact of global warming made the world leaders, business communities and other stakeholders are concerned with climate change issues. As a result, the international treaty on climate change The Kyoto Protocol was entered in force in the year 2005, which required member countries to reduce GHG emission up to a certain level. Later in 2015, the Paris agreement was signed by 195 countries, and 185 countries ratified it. In the Paris agreement, all the signatory countries set a temperature goal, which is to reduce the emission below 2°C (UNCC, 2014). It proposed some legal obligations of the signatory countries like national climate plan for every five years, provide national emission inventory, and reports the achievement at least for every two years.

The business sector is one of the major contributors to emissions of GHG because of its core functions such as electricity consumption, manufacturing process, distribution of goods and services. The business sector, particularly manufacturing business largely originates the energy consumptions (Ritchie, 2020). The huge consumption of energy is one of the major reasons for GHG emissions. Business should take measures to enhance energy efficiency in manufacturing to reduce energy-related CO<sub>2</sub> emissions (Biel & Glock, 2016). Since business sector is the major contributors of GHG emissions, climate change disclosure by them is a major area of research now. For last several decades, researchers try to explore the climate change disclosures issue by them.

There are several studies that tried to find the relationship between firm values and environmental disclosures (Cormier, Ledoux & Magnan, 2011; Clarkson et al., 2013; Cho et al., 2015). Most of them focused on the broad environmental disclosures. A very few studies were made on the Canadian Oil & Gas companies though it is one of the largest contributors of Green House Gases. In one study Berthelot & Robert, (2011) showed that level of disclosures by the Canadian Oil & Gas companies were very low. However, Environmental Committee in the Board of Directors had an influence on the disclosures. This low level of disclosures motivated me to do research on the Climate Change disclosures by the Canadian Oil & Gas companies. Moreover, a review of the literature suggests that no research to date has documented the value relevance of disclosures by the oil and gas companies in Canada. Based on this gap in the literature, this study investigates the research question.

*Does the extent of disclosures on climate change of oil and gas companies affect their market value?*

An index pertaining to the Disclosure of Climate Change Issues (DCCI) was created by this study. On the TSX, 80 oil and gas businesses are listed. The study has examined 80 annual reports, 17 sustainability reports, and 80 Annual Information Forms (AIF) from 2017. However, COMPUSTAT statistics are only accessible for 58 of the 80 firms. To conduct a content analysis, these 58 businesses are taken into account. The study goal was determined using regression analysis. As an independent variable, the Disclosure Index Score derived from the content analysis of 58 corporations is taken into consideration. As a stand-in for business value, the market to book assets ratio is employed. The validity of the conclusions is further examined using the market to book equity. According to the research on environmental disclosures, business size, profitability, and leverage all have an impact on climate-change disclosures (Freedman & Jaggi, 2005; Stanny & Ely, 2008). This study limits the impact of size, profitability, and leverage in line with other findings.

This study adds to the body of knowledge about the impact of disclosures on climate change problems on the value of businesses. According to empirical data, investors care about how much information is disclosed on climate change given the high market value of the companies. The results should motivate Canadian oil and gas corporations to reveal their strategy and activities for reducing GHG emissions as well as to reduce GHG emissions.

## 2. Literature Review

Canada is one of the major emitters of GHG. In a recent report on climate change performance showed that Canada is the third largest carbon emitter in the world and its performance is unsatisfactory in terms of the current level as well as the 2030 target (Burck, Marten, Bals, & Höhne, 2018). The Canadian government is taking an action plan to a clean climate change policy. The business sector is one of the major contributors to emissions of GHG because of its core functions such as electricity consumption, manufacturing process, distribution of goods and services (Ritchie, 2020). The business sector, particularly manufacturing business largely originates the energy consumptions. The huge consumption of energy is one of the major reasons for GHG emissions. Business should take measures to enhance energy efficiency in manufacturing to reduce energy-related CO<sub>2</sub> emissions (Biel & Glock, 2016). According to Climate Change Canada (2017), the oil and gas industry was the highest emitter of GHGs in 2017, approximately equaling 189.5 megatons of carbon dioxide. This high emission by the Oil & Gas companies has motivated me to work on the climate change disclosures issues by them.

Climate Change disclosures is a major area of research over the decades. Many researches have done to find the extent of the climate change disclosures by the companies. Stanny and Ely (2008) had studied on S&P 500 companies to find their disclosures level and they revealed that only the larger firms bothered about the climate change. In another study, Freedman and Jaggi (2011) have found that the companies within countries that ratified the Kyoto Protocol agreement. They also found the low level of disclosures. However, in their study they revealed that companies from EU, Canada, and Japan, had better disclosure practices than companies from US and India, which had not signed the protocol or set limits on reducing pollution emission. In summary, we can conclude that despite a burning issues, companies yet to concern about the disclosures of climate change since there are low level disclosures are observed. However large firm, strong regulated countries like countries signed Kyoto Protocol or Paris Agreement may act as determinant to disclosure on the climate change issues.

Environmental disclosures' value relevance is a hot topic in study right now. Many research have looked for a connection between business values and environmental disclosures. Plumlee, Brown, Hayes, and Marshall (2015) looked at the connection between a firm's worth and the calibre of its voluntary environmental disclosures. They discovered that disclosure quality is positively correlated with company value during the 2000–2005 study periods for the oil and gas, chemical, food and beverage, pharmaceutical, and electric utilities businesses. According to Cormier and Gordon's (2001) analysis of 212 Canadian corporations' annual reports spanning the years 1986 to 1993, there is a clear correlation between a company's stock market valuation and the environmental information given in its annual report. In a different research, Cormier and Magnan (2007) concentrated on companies from Canada, France, and Germany in an effort to determine the link between environmental reporting and company success. According to their research, environmental reporting has a moderating influence on German company performance, but it has little effect on Canadian and French company performance. Cho et al. (2015) looked for variables that could affect the reliability of Fortune 500 statistics from 1970 to 2010. Their findings suggest that investors do not view CSR

disclosures favourably. In conclusion, the research on the value relevance of environmental disclosures produced a range of findings. Some of them discover a strong correlation, while others don't detect any correlation at all.

Numerous researches looked for a link between voluntary disclosures and market business valuation. According to Clarkson et al. (2013), the enterprise value and cost of capital are related to the voluntary disclosures made in companies' sustainability reports or comparable web disclosures. They used a sample of 195 firm-year data for their investigation, including 93 businesses from 2003 and 103 firms from 2006. However, a corporation's cost of capital is unrelated to the extent of its voluntary environmental disclosure, according to the results, which demonstrated a substantial positive association between firm valuation and environmental disclosure measure. Cho, Guidry, Hageman, and Patten (2012) investigated the relationship between environmental performance ratings and significant US companies' voluntary disclosure practises. They utilised a sample of 92 US businesses that were exposed to more environmental factors. They discovered a link between environmental performance and disclosures, which shows that enterprises with poorer environmental performance make more disclosures.

In conclusion, there is conflicting evidence about the relationship between environmental disclosures and corporate value. According to one set of studies (Cormier & Magnan, 2001; Clarkson et al., 2013; Plumlee et al., 2015), there is a link between enterprises' market-based success and their environmental disclosures. The valuation of the company, on the other hand, was found to be negatively correlated with another group of research' findings on environmental disclosures (Cormier & Magnan, 2007; Cho et al., 2012; Cho et al., 2015). However, rather than focusing specifically on concerns related to climate change, the majority of research attempted to determine a link between general environmental reporting and business value. The relationship between the corporate value and the reporting on climate change is still very little understood.

There is relatively little information available on Canadian corporations' voluntary disclosures about climate change. Instead of specifically addressing climate change disclosures, the majority of research are restricted to concentrating on general environmental disclosures. In their comparative research of US, EU, Japanese, Canadian, and Indian corporations in 2011, Freedman and Jaggi concluded that Canadian and EU companies had better disclosures than US and Indian ones. A 2018 research by Chelli, Durocher, and Fortin looked at French and Canadian businesses. According to their research, the French political system has had better success than Canada's in promoting environmental reporting. The reporting requirements for fossil fuel firms were examined by Bebbington et al. (2019), along with a study of disclosure practises across time and within nations. Between 2011 and 2014, they looked at 35 businesses from 35 different countries, including Australia, Canada, China, South Africa, the UK, and the USA. Of the 35 enterprises, 19 were engaged in mining, 15 in oil and/or gas, and one was an organisation that handled both oil and gas and coal. They came to the conclusion that there aren't many revelations regarding carbon that can't be burned. Additionally, they came to the conclusion that there is no need to create new advice because the mechanisms for identifying unburnable carbon (if it exists) are already there in the current regulatory framework. However, this discovery raises the possibility that there may be an issue with the way the current guideline is translated into disclosure.

Research on the climate change disclosures by the Canadian oil & gas companies is still not satisfactory and there is also a big research gap. In 2017, it was found that Canadian oil & gas

companies emitted 189.5 megaton of carbon dioxide which was the largest among all the sectors (Climate Change Canada,2017). One of the major comprehensive study was made on the Canadian Oil & gas companies was made by Ben-Amar and McIlkenny in 2015. They made a study on 200 oil & gas companies in Canada from the year 2008 to 2011. Their findings revealed that there is a significant association between the board effectiveness and quality of climate change disclosures. However, they only find the association between Corporate Governance Variable (Board effectiveness) and climate change disclosures. They didn't study the association between disclosures and firm performance. Berthelot and Robert (2011) made a study on the disclosure of climate changes on Canadian oil and gas companies. Using the Canadian Institute of Chartered Accountant guidelines concerning climate change disclosures in annual reports, they tried to find the determinants of climate change disclosures. Findings revealed that disclosures of oil and gas companies are very low. High disclosures depend on the presence of environment committee, significant political exposure and strong media visibility, and a widely held ownership structure. However, their study focused only on the presence of environmental committee as corporate governance variable. They didn't also study on the value relevance of the disclosures.

A review of literature highlights that no research to date has documented value relevance of disclosures by the oil and gas companies in Canada. No previous study particularly addressed the value relevance of climate change disclosures issue by the Canadian Oil and Gas companies. As a result, this study tried to find out whether the extent of disclosures on climate change of oil and gas companies affect their market value.

### **3. Theoretical Framework**

Over the years, the main goal of a business was to maximize the shareholders' wealth. Now it is not limited only to shareholders. Businesses have to deal with various stakeholders and their interests. They have to identify the effect of their activities on all stakeholders to ensure the sustainability of the business. Stakeholders' expectation can be met through reporting. Otherwise, organizational legitimacy cannot be maintained (Salat, 2022). Stakeholder theory is cited by many researchers in social and environmental accounting research. Various stakeholders now create pressure on the companies to report on climate change issues. In addition to the investors, other stakeholders such as legislators, consumer groups, environmentalists, governments, leaders, and trade associations also demand that information (Prado-Lorenzo et al., 2009). To maintain the long run relationship with its stakeholders, companies should disclose the information on climate change issues according to their needs. Benefits of climate change disclosures to the external stakeholders can be addressed through stakeholder's theory. Stakeholders are now more concerned with the firm's climate change initiatives. According to Radhouane et al. (2018), a number of stakeholders are now exerting pressure on businesses to mitigate the environmental effects of their operations and to share their environmental performance.

Researchers used stakeholder theory to identify the value relevance of environmental disclosures. Shareholders are the major stakeholders and they are primarily concerned with the expected future profitability of the company (Cormier & Magnan, 2015). Many previous researchers verified the positive association between voluntary disclosures of carbon emissions and firm value within the context of stakeholders' theory. Voluntary environmental reporting allows stakeholders to precisely estimate the future earnings. As a result, voluntary disclosures enhance the firms' stock market valuation (Cormier & Magnan, 2007). The extent of non-financial information like Carbon emission disclosures provides investors use for

valuation of firms (Matsumura et al., 2014). In summary, climate change reporting can contribute to the value of the firm by offering useful information to the stakeholders.

#### 4. Hypothesis development:

Many previous studies explore the relationship between environmental disclosures and firm values. Those studies can be grouped into three types. Some of the examples of the literature that explores the relationship between environmental disclosures and firm values/performances are provided in Table 1.

**Table 1: Examples of some research on environmental disclosures and firm performances**

Environmental disclosures and Firm performances	Study	Nature of the relationship
Mandatory environmental disclosures and Firm performances	Blaconiere and Patten, 1994	Negative market reaction for environmental disclosures
	Connors et al., 2013	Mixed (both positive and negative) market reaction to environmental disclosures
Voluntary Environmental disclosures and firm performances	Matsumura et al., 2014; Cho et al., 2015	Negative firm value for environmental disclosures
	Plumlee et al., 2015	Voluntary environmental quality is positively associated with firm value
Voluntary environmental disclosures in sustainability reports and firm performances	Clarkson et al., 2013	Voluntary environmental disclosure enhances firm value
	Qiu et al., 2016	No significant relationship between environmental disclosures and firm performances

The first set of research (Blaconiere & Patten, 1994; Connors et al., 2013) looked for a connection between required environmental disclosure and companies' market success. The second group investigated how voluntary environmental disclosures affected the perceived value of businesses (Matsumura et al., 2014; Plumlee et al., 2015). The third group of research (Clarkson et al., 2013; Qiu et al., 2016) sought to determine the association between economic success and voluntary disclosures of environmental information through annual report and sustainability reports.

The results of studies on the connection between environmental disclosures and corporate value are contradictory. According to one set of studies (Cormier & Magnan, 2007; Clarkson et al., 2013; Plumlee et al., 2015), there is a link between enterprises' market-based success and their environmental disclosures. One of the main justifications for such a beneficial link comes from the fact that proactive environmental practises used by businesses may send out favourable signals to investors, increasing the value of the business (Clarkson et al., 2013). However, according to another set of researchers (Cormier & Magnan, 2007; Cho et al., 2015), there is no correlation between environmental disclosures and the firm's worth. The moderating impact of enterprises' environmental performances is one of the main hypotheses explaining the negative relationship. To lessen exposures resulting from their environmental consequences, organisations with poorer environmental performance frequently provide more thorough environmental disclosures (Cho et al., 2012; Cho et al., 2015).

According to the studies, there can be a connection between environmental disclosures and corporate performance that is either favourable or bad. In the context, I argue that climate change disclosures may convey positive signals about the pro-active environmental strategies, which in turns reduce the risks (discount rate). Based on this argument, I predict that climate change disclosures would enhance firms' market-based performances. However, if the climate change disclosure is a mere reflection of worse environmental performance, shareholders will

require additional risk premium, which in turn reduces firms' market-based performances. Thus, given the competing argument, I, therefore posit the alternative hypothesis as:

*H<sub>1</sub>: Climate change reporting has an impact (either positive or negative) on the market performance of the firm.*

The following equation is used as a regression model:

$$FVi = \alpha + \beta_1(DCCI_i) + \beta_2(SIZE_i) + \beta_3(LEVERAGE_i) + \beta_4(ROA_i) + \beta_5(ROE_i) + \epsilon_i$$

FVi = Firm Value of company i.

SIZE<sub>i</sub> = Total assets of company i. This is a representation of company size.

DCCI<sub>i</sub> = Disclosure on Climate Change Issues for company i.

LEVERAGE<sub>i</sub> = leverage of company i. It is found through the ratio of total debt to stockholders' equity.

ROE<sub>i</sub> = Return on Equity of company i at the end of the reporting year 2017

ROA<sub>i</sub> = Return on Assets of company i at the end of the reporting year 2017

$\epsilon_i$  = error.

$\beta_1, \beta_2, \dots, \beta_5$  = Coefficients of the explanatory variables.

$\alpha$  = regression intercept.

**Control Variables:** This study adjusts a few independent variables that were noted in earlier studies. The environmental disclosures made by the companies are impacted by those factors.

**Firm Size:** According to the literature (Freedman & Jaggi, 2005; Stanny & Ely, 2008; Prado-Lorenzo et al., 2009), firm size is a popular independent variable in environmental disclosure literature. As a result, the impact of company size is controlled in this study. Total assets and sales are typically used in the literature to measure corporate size. This study uses the logarithm of total assets to calculate the size of the company.

**Performance of the company:** Stakeholder theory predicts a positive correlation between climate change disclosures, which are a component of CSR disclosures, and corporate profitability since doing so increases the likelihood that the company will succeed financially. Numerous research examined the connection between business success and disclosures regarding reporting on climate change. According to the majority of studies, voluntary disclosure and profitability significantly correlate (Stanny & Ely, 2008; Prado-Lorenzo et al., 2009). In keeping with earlier studies on information disclosures made voluntarily, this study also takes corporate profitability into account. The Return on Equity (ROE) and Return on Assets (ROA) are the metrics used in this study to determine profitability.

**Leverage:** In the literature on reporting on climate change, leverage is a common measurement. Typically, it is calculated using the debt-to-equity ratio. The leverage ratio is utilised as an independent variable in numerous research on voluntary disclosure (Freedman & Jaggi, 2005). In keeping with earlier studies, this study also takes leverage into account. The debt to equity ratio is used in this context to assess leverage.

## 5. Methodology of the study

Through a content study of annual reports, annual information forms, and sustainability reports, a climate change disclosure index is created. The index is created using information from research institutions and academic journals that provide comprehensive rules for the disclosures of the companies' climate change reporting. The disclosure index for this study is calculated using the following principles:

1. Corporate Standard for GRI Guidelines and GHG Protocol
2. Guidelines for reporting in the oil and gas industry (IPIECA)

### 3. Academic writings on reporting climate change that make use of the Disclosures Index

From the above source, climate change disclosure issues have been developed where 16 specific issues are covered under five general topics. The justification of the inclusion of each item in the disclosure index is that every disclosure item should be at least in more than one document. If two reports use the same disclosure related issue, then it can be said that the issue signifies the importance to be included in the disclosures index. Table 2 presents the 16 specific issues under the five general issues.

**Table 2: Climate change issues for content analysis**

General Issues	Specific Climate change-related disclosers
a. Board oversight & Management responsibility	1. The organization has a specific board committee to oversee the environmental affairs 2. The organization has a specific board committee on climate change and GHG-related issues 3. CEO/chairperson expresses the organization's views on the issue of climate change through publicly available documents such as annual reports, sustainability reports and websites.
b. Emission Accounting	4. An organization report GHG in CO <sub>2</sub> equivalent 5. Reporting of Scope 1 (direct) and Scope 2 (Indirect) CO <sub>2</sub> emissions 6. Report total quantity of energy consumed in oil and gas operations or other business activities. 7. Report the quantity of hydrocarbon gas flared from operations. 8. Report total volume of freshwater withdrawn and Report total volume of freshwater consumed. 9. Total quantity, in metric tons, of hazardous waste, disposed. 10. A section in annual report/Annual Information Form devoted to climate change or global warming 11. The organization has set an emission baseline year by which to estimate future GHG emission trends. 12. Methodologies used to calculate or measure emissions 13. The organization has third-party verification processes for GHG emission data.
c. Research and Development	14. The organization has the policy to develop alternative/ renewable energy such as Nuclear, solar, hydropower and wind energy
d. Reporting Benchmark	15. The organization has the policy to comply with GRI guidelines and/or GHG Protocol standard
e. Potential Liability Reduction	16. The organization has a policy to minimize the potential regulatory risk and physical threats to assets related to climate change

Binary values are used to develop the index, i.e., 1 for the disclosure of a particular item and 0 for nondisclosure. A total score for all these 16 items is considered. That means a company can get the highest score of 16 for disclosing all these items. The lowest score can be 0 in case of non-disclosure of all of these items.

This Study allows finding the relationship between climate change reporting and the market performance of the firm. For this study, a total of 80 annual reports, 17 sustainability reports, 80 Annual Information Form (AIF) of the listed oil and gas companies of TSX have been analyzed for the year 2017. However, out of 80 companies, COMPUSTAT data are available for 58 companies. These 58 companies are considered for studies to make content analysis for the year 2017. The disclosures index score of these 58 companies is the primary variable of interest. Firm value is a dependent variable and is obtained from the COMPUSTAT database.



Control variables that were hypothesized to affect the firm value were derived from the company annual reports & COMPUSTAT. They include company size, profitability, and leverage.

After the data collection and identifying all the variables, the regression analysis has been conducted in the next stage. To measure the firm value, this study uses the market to book assets ratio as a proxy of firm value. The market to book equity is also used to increase the robustness' of the firm value variable. In many previous studies on environmental and CSR disclosures, firm value is used as a dependent variable. Firms' values are often measured as the market value of the equity in many studies (Cormier & Magnan, 2007; Matsumura et al., 2014; Cho et al., 2015). Firm value is used as the dependent variables and disclosures index score is used as main variable of interest for this research. However, as discussed in the hypothesis development section, this research controls the firm size, company performance and leverage.

## 6. Result and Analysis

6.1. **Descriptive Statistics:** Table 3 provides descriptive data for the study's variables.

**Table 3: Descriptive Statistics**

Variable	N	Mean	SD	p25	p50	p75
Total DCCI	58	4.67	4.46	2.00	2.00	8.00
Market to Book Assets	58	0.68	0.62	0.33	0.53	0.85
Market to equity	58	1.21	1.07	0.54	0.88	1.60
Size	58	7.00	1.90	5.64	7.11	8.00
Leverage	58	0.42	0.18	0.29	0.40	0.52
ROA	58	-0.04	0.15	-0.07	0.00	0.04
ROE	58	-0.13	0.43	-0.14	0.00	0.07

The mean, standard deviation, and percentile of the data set are displayed in the descriptive result. Market to Book assets and Market to Equity are the dependent variables of Firm Value (FV). The outcome shows that 4.6 out of a possible 16 is the average disclosure score for climate change-related problems. The outcome demonstrates that the overall evaluation of the disclosure issue is subpar. This dismal performance on climate change problems is consistent with earlier research (e.g. Berthelot & Robert, 2011). In terms of the control variables, the table reveals that the size proxy's mean value is seven, indicating that the sample includes a fair number of larger businesses. The mean ROA and ROE values are, respectively, -.04 and -.13. Their ranges imply that both successful and unsuccessful businesses are represented in the sample. The correlation indices between the variables are shown in Table 4.

**Table 4: Correlation Matrix of all variables**

	Total DCCI	Market to Book Assets	Market to equity	Size	Leverage	ROA	ROE
Total DCCI	1.00						
Market to Book Assets	0.15	1.00					
Market to equity	0.12	0.81	1.00				
Size	0.71	0.03	-0.07	1.00			
Leverage	0.02	-0.37	0.09	-0.06	1.00		
ROA	0.33	0.21	0.04	0.44	-0.27	1.00	
ROE	0.32	0.19	-0.24	0.50	-0.53	0.76	1.00

As can be seen in table 4, there is a positive correlation between the independent variable (DCCI) and the dependent variables (represented by market to book assets and market to book equity) at .15 and .12, respectively. This result supports the idea that there is a link between

corporate value and disclosure of climate change. The table demonstrates that the predictors do not significantly correlate with one another. A slight link between DCCI, Market to Book assets, and Market to Equity has been found. Table also demonstrates that correlations between explanatory factors are much below the threshold (.7). There is no evidence of multicollinearity based on the low degree of relationships between the explanatory variables.

## 6.2. Regression analysis:

The regression result is presented in table 5.

**Table 5: Regression result of the study**

Dep. Var -->	logScore	Mkt2BookEquity	Mkt2BookAssets
Ind. Variables	(1)	(2)	(3)
logScore		0.408*	0.243*
		(1.89)	(1.91)
Size	0.318***	-0.092	-0.075
	(6.09)	(-0.86)	(-1.19)
Leverage	-0.002	-1.079	-1.490***
	(-0.00)	(-1.16)	(-2.72)
ROA	0.363	3.812***	1.056
	(0.42)	(2.83)	(1.33)
ROE	-0.024	-1.971***	-0.345
	(-0.07)	(-3.41)	(-1.01)
Constant	-1.064**	1.720**	1.552***
	(-2.66)	(2.58)	(3.94)
Observations	58	58	58
Adjusted R-squared	0.484	0.173	0.145

t-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The study's regression outcome is noteworthy. Market to book equity and dependent variable market to book assets both have a 10% level of significance for the primary variable of interest (DCCI). The outcome shows that the sample companies' disclosures of information on climate change had a favourable impact on the firm's worth. The results are consistent with the hypotheses that climate change disclosures have a major impact on oil and gas company stock values. However, both of the positive coefficient values show that the market reacts favourably to the climate change disclosures, showing that the disclosures have value. The relationship between the control variable, size, and company value is not statistically significant. Regression analysis shows that profitability (as determined by ROA and ROE) and leverage are important control factors. It means that there is a strong correlation between the worth of the businesses and successful, leveraged companies.

## 6.3. Discussion of findings:

The findings indicate a substantial correlation between corporate value and disclosures about climate change. It shows that the market value of the company will increase as a result of disclosures on climate change. The market value of the companies will probably increase as more climate change information is disclosed. The results are more in line with earlier research (Clerkson et al., 2013, Cormier & Magnan, 2015, Plumlee et al., 2015), which suggested that publishing environmental information would be more likely to improve the market performance of the companies. The results confirm earlier studies' findings that voluntary

information disclosures and business market success are positively correlated. From an economic perspective, this outcome makes sense. A rise in climate change disclosures is thought to be regarded favourably because the market to book and market to equity coefficients are, respectively, .408 and .243. The outcome implies that a proactive approach to climate change and signalling to stakeholders can increase the firm's worth. The data also lend credence to the stakeholder idea. The main stakeholders are the shareholders, who are mostly focused on the anticipated future profitability of the business (Cormier & Magnan, 2015). The hypothesis that stakeholders favourably regarded the firm's climate change disclosure initiatives in terms of high market value of the firm is supported by the positive correlation between environmental disclosures and enterprise values. Despite the fact that the study's findings indicate a positive relationship between corporate value and disclosures regarding climate change, there are two important limitations. First, the correlation between disclosures and company valuation is only somewhat significant at the 10% level, making the statistical significance of the conclusion questionable. This is probably due to the poor power of this study, which contains only 58 observations. Second, the study's ultimate sample size of 58 may make it difficult for the results to be generalised. As a result, it is important to use caution when interpreting the study's results. In sum, the findings of this investigation are as follows:

**Firstly**, there is still a dearth of climate change reporting by Canadian oil and gas businesses. The lack of accounting requirements for GHG emission for Canadian corporations may be one factor for these subpar reporting.

**Secondly**: The correlation between climate change disclosures and firm value suggests that investors take into account the level of climate change disclosures when determining the market value of the firms.

## 7. Conclusion

### 7.1. Research findings and implications

In order to create a score for the disclosures index, this research first conducted a content analysis of the climate change disclosures. I then sought to determine the worth and relevance of the disclosure index score. There are some theoretical and practical ramifications for each stage (content analysis and regression analysis).

First off, since it provides a summary of the practises used by Canadian oil and gas corporations in their climate change disclosures, the findings from the content analysis will add to the body of knowledge in environmental accounting. According to the research, Canadian oil and gas businesses continue to disclose little about climate change. Hopefully, it will serve as a catalyst for the oil and gas industry. Companies are anticipated to adhere to stakeholders' expectations on accountability to climate change if they boost disclosures of their practises related to climate change. The results of the content analysis also have applications in the real world. The Canadian Security Administrator (CSA) plans to put into action an initiative on climate change disclosure (CSA, 2018). The results of this investigation will give CSA insight into current methods for disclosing climate change and serve as a framework for formulating disclosure requirements.

Second, this study investigates the connection between corporate value and disclosures about climate change. According to empirical data, investors care about how much information is disclosed on climate change given the high market value of the companies. Investors view the disclosures of climate change as represented in the firm value, which is revealed by the findings of this significant correlation between firm value and climate change disclosures. These findings will add to the current environmental accounting literature. Additionally, it ought to

motivate Canadian oil and gas corporations to lower their carbon footprints and reveal how they control their carbon emissions.

## 7.2. Research Limitations

There are several restrictions on this research. Some of the restrictions I have run with are listed below. In order to determine the association between climate change disclosures and firm values, the study only includes 58 firms for the year 2017. A greater sample size might offer more illuminating data regarding the climate change disclosures. Second, only Canadian oil and gas companies are the subject of this investigation. The findings of this study shouldn't be applied to other industries or nations. Third, there are drawbacks to the binary scoring method. Regardless of the nature or importance of any item, it assigns equal weight to all of them. For instance, if an item is reported, its score is 1, regardless of how much is discussed. Therefore, in-depth discussion is disregarded. However, this type of scoring method (disclosure present or absent) necessitates less judgement (Milne & Adler, 1999). Last but not least, the report does not differentiate between good and bad environmental performance. According to a review of the environmental economics literature by Clarkson et al. (2013), there are two different sorts of environmental performers: good environmental performers and terrible environmental performers. Separate value relevance of both successful and unsuccessful climate change disclosures, however, would provide an intriguing insight that was lacking in our study.

## 7.3. Scope for future research

There are some specific issues that are subject to further research that stems from this study. Firstly, this research investigates the climate change disclosures practices of oil and gas companies listed on TSX. Further research would utilize this index on a large number of companies, including the entire emission-intensive sector. It will be interesting to investigate whether the findings can be applied more broadly for other emissions-intensive sectors. Secondly, this research does not separate the good and bad performers and their value relevance. Separate value relevance of both good and bad performers of climate change disclosures would give a fascinating insight which was absent in this research. This segregation will demand future research.

## References

- Bebbington, J., Schneider, T., Stevenson, L., & Fox, A. (2019). Fossil fuel reserves and resources reporting and unburnable carbon: Investigating conflicting accounts. *Critical Perspectives on Accounting*, doi:10.1016/j.cpa.2019.04.004
- Biel, K., & Glock, C. H. (2016). Systematic literature review of decision support models for energy-efficient production planning. *Computers & Industrial Engineering*, 101, 243-259. doi:10.1016/j.cie.2016.08.021
- Ben-Amar, W., & McIlkenny, P. (2015). Board effectiveness and the voluntary disclosure of climate change information. *Business Strategy and the Environment*, 24(8), 704-719.
- Berthelot, S., & Robert, A. M. (2011). Climate change disclosures: An examination of Canadian oil and gas firms. *Issues in Social and Environmental Accounting*, 5(1/2), 106-123.
- Blacconiere, W. G., & Patten, D. M. (1994). Environmental disclosures, regulatory costs, and changes in firm value. *Journal of accounting and economics*, 18(3), 357-377.
- Burck, J., Marten, F., Bals, C., & Höhne, N. (2018). *The climate change performance index: results 2018*. Berlin: Germanwatch.
- Canadian Securities Administrators (CSA). (2018). Canadian securities regulators report on climate change-related disclosure project. Retrieved from <https://www.securities-administrators.ca/aboutcsa.aspx?id=1677>
- Chelli, M., Durocher, S., & Fortin, A. (2018). Normativity in environmental reporting: A comparison of three regimes. *Journal of Business Ethics*, 149(2), 285-311.
- Cho, C. H., Guidry, R. P., Hageman, A. M., & Patten, D. M. (2012). Do actions speak louder than words? an empirical investigation of corporate environmental reputation. *Accounting, Organizations and*

- Society*, 37(1), 14-25. doi:10.1016/j.aos.2011.12.001
- Cho, C. H., Michelon, G., Patten, D. M., & Roberts, R. W. (2015). CSR disclosure: the more things change...?. *Accounting, Auditing & Accountability Journal*, 28(1), 14-35.
- Clarkson, P. M., Fang, X., Li, Y., & Richardson, G. (2013). The relevance of environmental disclosures: are such disclosures incrementally informative? *Journal of Accounting and Public Policy*, 32(5), 410-431.
- Climate Change Canada. (2017, April 13). Greenhouse gas emissions by Canadian economic sector. Retrieved March 26, 2018, from <https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions/canadian-economic-sector.html>
- Connors, E., Johnston, H. H., & Gao, L. S. (2013). The informational value of Toxics Release Inventory performance. *Sustainability Accounting, Management and Policy Journal*, 4(1), 32-55.
- Cormier, D., & Gordon, I. M. (2001). An examination of social and environmental reporting strategies. *Accounting, Auditing & Accountability Journal*, 14(5), 587.
- Cormier, D., & Magnan, M. (2007). The revisited contribution of environmental reporting to investors' valuation of a firm's earnings: An international perspective. *Ecological economics*, 62(3-4), 613-626.
- Cormier, D., & Magnan, M. (2015). The economic relevance of environmental disclosure and its impact on corporate legitimacy: An empirical investigation. *Business Strategy and the Environment*, 24(6), 431-450.
- Freedman, M. & Jaggi, B. (2005). Global warming, commitment to the Kyoto protocol, and accounting disclosure by the largest global public firms from polluting industries. *The International Journal of Accounting*, 40, 215-232.
- Freedman, M., & Jaggi, B. (2011). Global warming disclosures: impact of Kyoto protocol across countries. *Journal of International Financial Management & Accounting*, 22(1), 46-90.
- Matsumura, E. M., Prakash, R., & Vera-Munoz, S. C. (2014). Firm-value effects of carbon emissions and carbon disclosures. *The Accounting Review*, 89(2), 695-724. doi:10.2308/accr-50629
- Ritchie, H. (2020, May 11). CO<sub>2</sub> and Greenhouse Gas Emissions. Retrieved from <https://ourworldindata.org/emissions-by-sector>
- Salat, A. (2022). Climate Change Disclosure: An Empirical Study On The Oil & Gas Companies Listed on Toronto Stock Exchange (TSX). *The Cost & Management*, L(6), 4-16. <https://doi.org/10.32920/14662968.v1>
- Stanny, E. & Ely, K., 2008, Corporate Environmental Disclosures about the Effects of Climate Change, *Corporate Social Responsibility and Environmental Management*, Vol. 15, No. 6, pp. 338-348.

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