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CLIMATE-RELATED FINANCIAL DISCLOSURES (CRFD) AND THE VALUE OF LISTED ENVIRONMENTALLY SENSITIVE COMPANIES IN CANADA

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ABSTRACT

Purpose

This study investigates how climate-related financial disclosure (CRFD) influences firm value in Canada's environmentally sensitive sectors, with a focus on whether institutional ownership moderates this relationship.

Design/Methodology/Approach

Using panel data from listed 25 high-emission, resource-dependent firms between 2015 and 2024, the study employs dynamic panel Generalized Method of Moments (GMM) estimation to mitigate endogeneity concerns. CRFD indices are constructed in alignment with the Task Force on Climate-related Financial Disclosures (TCFD) and International Sustainability Standards Board (ISSB) frameworks. Firm value is measured using Tobin's Q, market-to-book ratio (MBR) and stock returns.

Findings

CRFD shows a significant positive effect on Tobin's Q and MBR, indicating that climate transparency enhances market valuation. However, no significant effect is found for stock returns, suggesting limited short-term market responsiveness. The interaction analysis reveals that institutional ownership concentration significantly strengthens the CRFD–valuation link for Tobin's Q and MBR, underscoring the role of investor structure in shaping disclosure credibility and market interpretation.

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Originality/Value

This study offers the first sector-specific Canadian evidence on the valuation effects of CRFD, integrating institutional ownership as a moderating mechanism. The use of multiple valuation proxies and a disclosure index grounded in TCFD/ISSB guidelines provides a robust, replicable framework for assessing ESG disclosure impacts.

KEYWORDS: - Climate-related financial disclosure, Tobin's Q, market-to-book ratio, stock returns, institutional ownership, environmentally sensitive sectors, Canada.

1.0 INTRODUCTION

The growing recognition of climate change as a material financial risk has accelerated the push for more transparent and standardized climate-related financial disclosures (CRFD) among publicly listed companies worldwide. Frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD) and the newly established International Sustainability Standards Board (ISSB) have laid the foundation for integrating environmental risks into mainstream financial reporting. Canadian regulators including the Canadian Securities Administrators (CSA) and the Office of the Superintendent of Financial Institutions (OSFI) have aligned with these global standards and are taking concrete steps toward mandating such disclosures for domestic firms (TCFD, 2017; CSA, 2022; OSFI, 2023; IFRS Foundation, 2023).

This transition is particularly consequential for carbon-intensive and climate-exposed sectors such as energy, mining, manufacturing, and forestry, which collectively anchor Canada's economy. These sectors face heightened vulnerability to both physical and transition climate risks, including carbon pricing mechanisms, emissions regulations and the potential for stranded assets (OSFI, 2023). For example, firms in the oil and gas industry are under growing pressure to justify the long-term viability of their reserves under net-zero scenarios, while mining companies are increasingly held accountable for environmental degradation and resource extraction practices (Natural Resources Canada, 2023). At the same time, financial institutions are expected to integrate climate risk into their lending and investment portfolios, positioning them as both exposed stakeholders and strategic enablers of Canada's transition to a low-carbon economy (Bank of Canada & OSFI, 2022).

Despite the rising importance of CRFD, empirical research examining its impact on firm value within the Canadian context to the best of researcher's knowledge and extent literature reveals, remain limited. While international studies have demonstrated that high-quality climate disclosures are likely to enhance transparency, reduce capital costs and improve investor confidence (Luo et al., 2012; Krueger et al., 2020), the value relevance of such disclosures have not been rigorously validated in Canada's resource-heavy and disclosure-diverse sectors, where

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investor expectations and regulatory environments are rapidly evolving. Additionally, many of these studies (e.g., Luo et al., 2012; Matsumura et al., 2014; Krueger et al., 2020; Haque & Deegan, 2010; Amel-Zadeh & Serafeim, 2018) aggregate firms across industries, overlooking sector-specific climate exposure, which may mask how CRFD influences firm valuation in high-impact sectors.

Another overlooked dimension in the current literature is the role of institutional ownership as a moderating variable. Institutional investors particularly long-term, ESG-oriented asset managers have increasingly been shown to influence corporate disclosure behaviour and shape market responses to sustainability information (Dyck et al., 2019; Amel-Zadeh & Serafeim, 2018). Under agency theory, institutional investors are seen as external monitors who demand higher disclosure quality to reduce information asymmetry and protect their investments (Jensen & Meckling, 1976). From a signaling perspective, firms with higher institutional ownership may be more likely to issue credible, forward-looking climate disclosures that attract markets reward. Yet, little empirical work has explored how institutional ownership concentration moderates the CRFD–firm value relationship, especially in sectors where such ownership plays a key role in capital allocation and governance influence.

Given the paucity of sector-specific research and the underexplored moderating role of institutional ownership, this study responds to a pressing need for focused empirical inquiry. As IFRS S1 and S2 standards become embedded in Canadian disclosure practice, understanding the value relevance that is, the extent to which climate-related disclosures affect a firm's market valuation becomes critical for investors, regulators, and corporate leaders navigating the low-carbon transition. This study addresses this gap by examining how climate-related financial disclosures (CRFD) influence firm value in Canada's climate-vulnerable sectors. It further explores whether institutional ownership concentration moderates this relationship, offering a novel view of how disclosure credibility and investor structure shape market outcomes. Using panel data regression and CRFD indices aligned with TCFD and ISSB frameworks, the study provides evidence-based insights into when and how climate transparency translates into valuation gains.

2.0 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Climate-related financial disclosure (CRFD), as encouraged by the TCFD and ISSB frameworks, provides structured information on a firm's climate risks, opportunities, and strategic responses. From a theoretical standpoint, CRFD aligns with the signaling theory, which posits that firms can use voluntary disclosure to signal quality and reduce information asymmetry (Spence, 1973). Additionally, stakeholder theory (Freeman, 1984) and legitimacy theory suggest that greater

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transparency in sustainability matters improves stakeholder trust, enhances reputation, and may lead to better financial outcomes (Suchman, 1995).

Empirically, numerous studies have investigated how CRFD affects different dimensions of firm value (e.g., Matsumura et al., 2014; Dhaliwal et al., 2011; Krueger et al., 2020; Hsu et al., 2022; Flammer, 2021; Gu, 2023). However, much of the evidence remains generalized, lacking sectoral granularity, especially in Canadian contexts. The following subsections develop specific hypotheses linking CRFD to three commonly used firm value proxies: Tobin's Q, market-to-book ratio and stock returns.

2.1 CRFD and Institutional Ownership and Tobin's Q

Tobin's Q, defined as the ratio of a firm's market value to the replacement cost of its assets, captures investor expectations regarding intangible value, risk-adjusted returns, and future growth potential (Zhou et al., 2022; Lins & Servaes, 2023). Climate-related financial disclosures (CRFD) have been shown to influence Tobin's Q by reducing information asymmetry, clarifying long-term climate strategies, and signaling climate resilience to capital markets (Zhou et al., 2022; Bui et al., 2023; López-Arceiz et al., 2021). Disclosures aligned with frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD) enhance investor confidence by demonstrating preparedness for regulatory transitions, reputational risks, and carbon pricing mechanisms, all of which are increasingly material in firm valuation models (Gu, 2023). High-quality CRFD is particularly value-relevant in environmentally sensitive sectors (e.g., energy, mining), where environmental risks directly affect asset valuation and cash flows (Luo et al., 2012; Krueger et al., 2020). By outlining transition plans, emissions targets, and scenario analyses, firms can mitigate perceived regulatory and reputational risks, thereby enhancing their market valuation beyond book value (Ilhan et al., 2021).

Importantly, institutional ownership plays a significant role in shaping how markets interpret climate-related disclosures. Institutional investors, such as pension funds and asset managers, have the resources and expertise to evaluate complex environmental information and often demand higher-quality reporting from firms. According to Agency Theory (Jensen & Meckling, 1976), institutional investors act as effective monitors, ensuring that sustainability disclosures are credible and aligned with shareholder interests. Similarly, Signalling Theory (Spence, 1973) suggests that when firms with substantial institutional ownership provide detailed CRFD, the market perceives these disclosures as more reliable, thus amplifying their value relevance. Therefore, institutional ownership is expected to strengthen the relationship between CRFD and Tobin's Q by enhancing disclosure credibility and increasing investor trust.

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H_1: Institutional Ownership *has significant moderating effect on CRFD and Tobin's Qamong listed environmentally sensitive companies in Canada.*

2.2 CRFD, Institutional Ownership and Market-to-Book Ratio

The market-to-book ratio (MBR), which compares a firm's market capitalization to its book value, captures investors' expectations about the firm's intangible assets, including reputation, brand equity, and future growth prospects (Liu et al., 2014; Lev & Radhakrishnan, 2005; Chen et al., 2005). Climate-related financial disclosures (CRFD) contribute to these intangibles by improving transparency, aligning with investor environmental, social, and governance (ESG) expectations, and demonstrating corporate accountability (Dhaliwal et al., 2011; Amel-Zadeh & Serafeim, 2018). Firms that proactively disclose climate risks and mitigation strategies can build reputational capital, strengthen stakeholder relationships, and increase investor confidence, leading to higher market valuations beyond book value (Eccles et al., 2012; Hsu et al., 2022). This is particularly relevant as ESG-focused investors increasingly screen portfolios based on sustainability performance (Amel-Zadeh & Serafeim, 2018; Krueger et al., 2020).

The Stakeholder Theory (Freeman, 1984) supports this argument, suggesting that firms addressing broader stakeholder concerns including climate impacts, are more likely to achieve long-term success and superior valuations. However, Signaling Theory (Spence, 1973) provides a complementary perspective, positing that climate-related disclosures act as positive signals of superior governance, risk management, and future resilience. High-quality CRFD can therefore increase market confidence and elevate a firm's MBR, particularly in environmentally sensitive sectors where exposure to regulatory and reputational risks is high. Conversely, critics caution that excessive or poorly structured disclosures may impose compliance costs or reveal unquantified risks, potentially reducing investor appetite (Cho et al., 2012).

Importantly, institutional ownership plays a key role in shaping the market's response to climate disclosures. Institutional investors, such as pension funds and asset managers, possess the resources and expertise to evaluate complex ESG information and are more likely to demand credible, high-quality reporting. According to Agency Theory (Jensen & Meckling, 1976), their monitoring role reduces managerial opportunism, ensuring that climate disclosures are trustworthy and aligned with shareholder interests. When firms with high institutional ownership provide detailed CRFD, markets are more likely to view these disclosures as reliable, thereby amplifying their positive effect on MBR. Thus, institutional ownership is expected to strengthen the relationship between CRFD and MBR by enhancing credibility, reducing information asymmetry, and reinforcing investor confidence.

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H_2: Institutional Ownership *has significant effect on CRFD and market-to-bookamong listed environmentally sensitive companies in Canada.*

2.3 CRFD, Institutional Ownership and Stock Returns

Stock returns reflect investors' immediate response to firm performance and expectations, serving as a key indicator of how markets value both tangible and intangible factors (Gu, 2023). Climate-related financial disclosures (CRFD) may influence stock returns by providing forward-looking insights into firms' risk exposure, transition strategies, and adaptability to climate-related challenges. Under the Efficient Market Hypothesis (EMH), relevant public information such as CRFD is rapidly incorporated into stock prices, enabling investors to price securities more accurately (Berg et al., 2020). Firms that disclose credible climate transition strategies and demonstrate resilience are more likely to attract long-term ESG-focused investors, reduce perceived risk, and benefit from upward stock price adjustments (Matsumura et al., 2014; Ilhan et al., 2021).

Empirical studies provide mixed but generally positive evidence on the impact of CRFD on stock performance. Some studies (Gu, 2023; Lin & Wu, 2023; Huang & Li, 2020) document that high-quality climate disclosures enhance investor confidence and mitigate information asymmetry, leading to improved returns. Others highlight that firms adopting early and proactive disclosure practices especially in environmentally sensitive sectors, experience lower stock price volatility during climate-related policy announcements or environmental incidents (Flammer, 2021). These findings suggest that CRFD can function as a market signal of superior governance, long-term strategic adaptability, and proactive risk management, which investors reward in the form of stronger price performance.

However, the role of institutional ownership is pivotal in strengthening this relationship. Institutional investors, given their sophistication and analytical capacity, are better positioned to assess the credibility of CRFD and integrate such information into their investment decisions. According to Signaling Theory (Spence, 1973), climate disclosures from firms with substantial institutional ownership are perceived as more reliable, thereby enhancing investor response in the stock market. Furthermore, Agency Theory (Jensen & Meckling, 1976) suggests that institutional investors act as effective monitors, aligning management incentives with shareholder interests and ensuring that CRFD reflects substantive climate strategies rather than symbolic compliance. As a result, institutional ownership is expected to amplify the positive influence of CRFD on stock returns by improving disclosure quality, increasing investor trust, and reinforcing market confidence.

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H_3: Institutional Ownership *has significant moderating effect on CRFD and stock returns among listed environmentally sensitive companies in Canada.*

3.0 RESEARCH METHODOLOGY

This study adopted a longitudinal research design and utilised panel data from multiple firms over an extended period. The population of this study consisted of all the companies listed on the Toronto Stock Exchange that are considered to be environmentally sensitive, basically in manufacturing, mining, energy, and forestry. Given the large population, this study employed the purposive sampling technique where twenty (20) companies were selected, five (5) from each of the four sectors. The sample selection was based on the availability and completeness of financial and ESG reports from 2015 to 2024, focusing on environmentally sensitive companies listed on the Toronto Stock Exchange with consistent data throughout the study period. The study used secondary sources for data collection. This study used the generalised Method of Moments (GMM), a dynamic panel data estimator, as the main statistical technique for analysis. Furthermore, to validate the reliability and consistency of the GMM estimation results, a series of post-estimation diagnostic tests such as the Arellano-Bond test for autocorrelation and the Sargan (1958) and Hansen (1982) tests of over identifying restrictions were conducted.

The econometric models are specified below:

$$TQ_{it}=\beta_0+\beta_1 TQ_{it-1}+\beta_2 CRFDit+\beta_3 IO_{it}+\beta_4 CRFD_{it}*1O_{it}+eit \quad \text{.....(i)}$$

$$MBR_{it}=\beta_0+\beta_0 MBR_{it-1}+\beta_2 CRFDit+\beta_3 IO_{it}+\beta_4 CRFD_{it}*IO_{it}+eit \quad \text{.....(ii)}$$

$$SR_{it}=\beta_0+\beta_1 SR_{it-1}+\beta_2 CRFDit+\beta_3 IO_{it}+\beta_4 CRFD_{it}*IO_{it}+eit \quad \text{.....(iii)}$$

Where:
TQ= Tobin's Q, MBR= Market-to-Book Ratio, SR= Stock Returns, IO= Institutional Ownership, CRFD= Climate Related Financial Disclosure, βo = Constant, Ɛ= Error Term, i=Cross Section, t= Time Series

Table 1:
Measurements of Variables

S/N	Variable	Type	Measurement	Source
1	Tobins Q	Dependent	Market value of equity + total liabilities / total assets	Zhou et al., 2022; Lins & Servaes, 2023
2	Market to Book Ratio	,,	Market value per share / Book value per share	Cho et al., 2012; Grewal et al., 2021

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3	Stock Returns	,,	Annual stock price return (log of P_t/P_{t-1})	Gu, 2023; Lin & Wu, 2023; Jiang, 2019
4	Institutional Ownership	Moderating	Proportion of shares held by institutional investors	Amel-Zadeh & Serafeim, 2018; Dyck et al., 2019
5	Climate-Related Financial Disclosure	Independent	Actual Disclosure index/ Expected TCFD and ISSB Checklist	Haque & Deegan, 2010; Bui et al., 2023

Source: Researcher's Compilation, 2025

4.0 DATA ANALYSIS AND DISCUSSIONS OF FINDINGS

4.1 Descriptive Statistics

The statistical measures presented in Table 2 provide a comprehensive summary of the key variables employed in this study, including both the dependent variables, the independent variable and the moderator variable. These measures capture the mean, standard deviation, minimum and maximum values, and help to describe the distributional properties of the balanced panel dataset used in the analysis.

Table 2:

Summary Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
TQ	200	1.045984	0.525642	0.468	2.7981
MBR	200	1.423468	0.882686	0.20362	5.6544
SR	200	0.157152	0.318406	-0.5161	1.3385
CRFD	200	0.7022	0.111541	0.44	0.92
IO	200	0.210808	0.15467	0.052	0.488846
CRFD*IO	200	0.146919	0.110966	0.029663	0.401557

Source: Author's Computation from STATA 18 (2025)

The summary descriptive statistics in Table 2 provide an overview of the distribution and variability of the variables employed in a balanced panel dataset comprising 200 observations, derived from 20 listed manufacturing firms tracked annually over the 10-year period from 2015 to 2024. From the result, Tobin's Q (TQ), a proxy for firm value, has a mean of approximately 1.05 with a standard deviation of 0.53, suggesting that, on average, sampled firms have a slightly higher market valuation than their asset replacement cost. The minimum and maximum values (0.47 and 2.80) indicate substantial variation across firms. The Market-to-Book Ratio (MBR), another valuation indicator, shows a wider spread (Mean = 1.42, Std. Dev. = 0.88), ranging from

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0.20 to 5.65. This suggests that while some firms may be undervalued relative to their book value, others are highly valued in the capital market, possibly due to future growth expectations. Again, stock returns (SR) average 15.7%, with a standard deviation of 31.8%, and range from a negative return of -51.6% to a positive return of 133.8%. The negative minimum suggests the presence of loss-making periods or downturns for some firms during the study window.

Meanwhile, Climate-Related Financial Disclosure (CRFD) has a mean score of 0.702 (on a scale of 0 to 1), indicating a relatively high level of compliance with TCFD-aligned disclosure expectations among the sampled firms. However, the range (0.44 to 0.92) shows that not all firms uniformly adopt these practices. Institutional Ownership (IO) exhibits a mean of 0.211, implying that, on average, institutional investors hold about 21.1% of firm shares. The relatively low minimum value (0.052) suggests that some firms have limited institutional presence, which could influence disclosure incentives and governance structures. Finally, the interaction term (CRFD*IO) has a mean of 0.147 and a standard deviation of 0.111, reflecting moderate variability in the interaction between CRFD and institutional ownership, a central moderating variable in the specified econometric models.

4.2 Correlation Matrix

A correlation matrix is a table showing correlation coefficients between variables. Each cell in the table shows the correlation between two variables. A correlation matrix is used to summarize data, as an input into a more advanced analysis, and as a diagnostic for advanced analyses. Table 3 shows the correlation between the dependent variable, independent variable, the moderator variable as well as among the independent variables.

Table 3:

Correlation Matrix

Variables	TQ	MBR	SR	CRFD	IO	CRFD*IO
TQ	1.0000					
MBR		1.0000				
SR			1.0000			
CRFD	-0.1162	0.1010	0.0351	1.0000		
IO	0.0198	-0.1839	0.0734	-0.0646	1.0000	
CRFD*IO	0.1150	0.0133	0.0789	-0.0356	0.1857	1.0000

Note: Diagonal values represent self-correlation (=1). Empty cells above the diagonal are omitted for brevity.

Source: Author's Computation from STATA 18 (2025)

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The correlation results presented in Table 3 reveal that the relationships between the dependent variables: Tobin's Q (TQ), Market-to-Book Ratio (MBR), and Stock Returns (SR)and the independent variable: Climate-Related Financial Disclosure (CRFD) and the moderator variable: Institutional Ownership are generally weak, with all coefficients falling below ±0.20. Specifically, TQ shows a weak positive correlation with CRFD*IO (0.115), suggesting a potential moderating influence of institutional ownership on the relationship between climate disclosure and firm value. MBR is negatively correlated with institutional ownership (–0.1839), which may indicate that higher institutional control is associated with lower market valuation in this context. SR exhibits weak positive correlations with all predictors, but none of the associations are substantial enough to raise multicollinearity concerns. Furthermore, the correlations among the independent variables themselves are all well below the commonly accepted threshold of 0.80, indicating that they are not excessively or unhealthily correlated. According to Gujarati (2003), multicollinearity becomes problematic when inter-variable correlations exceed 0.80, and by this standard, the present dataset is well-suited for regression analysis.

4.3 Two-Step Dynamic Panel Regression

Table 4: Summarized Two-Step GMM Result

Variables	Model 1 (TQ)	Model 2 (MBR)	Model 3 (SR)
L1.Dependent	0.4251 (0.1715), p=0.035	-0.1762 (0.0523), p=0.008	-0.8125 (0.3009), p=0.024
CRFD	-1.9842 (0.6512), p=0.013	0.7321 (0.2939), p=0.034	1.3947 (2.1284), p=0.529
IO	-3.3265 (1.1015), p=0.014	-1.5947 (4.3581), p=0.723	4.5975 (5.1154), p=0.392
CRFD*IO	4.6173 (1.4290), p=0.010	6.2832 (2.1240), p=0.015	-6.7190 (7.1697), p=0.373
Constant	1.9235 (0.6789), p=0.020	1.6404 (1.3179), p=0.245	-0.7353 (1.4519), p=0.625

Note: Standard errors in parentheses. All models are estimated using two-step system GMM.
Significance levels: *p < 0.01, p < 0.05
Source: Author's Computation from STATA 18 (2025)

For model one, the coefficient of the lagged dependent variable (L1.TQ) is positive and statistically significant at the 5% level (β = 0.4251, p = 0.035), indicating that past firm value positively influences current firm value, which reflects persistence in firm performance over time. The coefficient of climate related financial disclosure (CRFD)has a negative and significant (β = –1.9842, p = 0.013) on Tobin's Q. while institutional ownership (IO) is also negatively associated with Tobin's Qbut statistically significant (β = –3.3265, p = 0.014). Interestingly, the result revealed that institutional ownership has a significant moderating effect

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on the relationship between CRFD and Tobin's Q (β = 4.6173, p = 0.010). The constant term is also significant (p = 0.020), confirming the presence of a non-zero baseline firm value.

In the second model, the lagged Market to book Ratio (MBR) is negative and statistically significant (β = –0.1762, p = 0.008), suggesting a slight mean-reverting behaviour in market valuation relative to book value. The result demonstrated that CRFD has a positive and significant effect on MBR (β = 0.7321, p = 0.034). However, IO shows a negative but insignificant effect (β = –1.5947, p = 0.723), while the interaction term of CRFD and IO has positive and statistically significant effect on MBR (β = 6.2832, p = 0.015).The constant term is not statistically significant (p = 0.245), suggesting that market-to-book ratios are largely driven by the explanatory variables.

In model three, the lagged stock return (L1.SR) is negative and significant (β = –0.8125, p = 0.024), which may reflect correction mechanisms in investor pricing following abnormal returns. However, in contrast to Models 1 and 2, the coefficients of CRFD (β = 1.3947, p = 0.529), IO (β = 4.5975, p = 0.392), and the interaction term CRFD*IO (β = –6.7190, p = 0.373) are all statistically insignificant, indicating that neither climate-related disclosures nor institutional ownership significantly predict contemporaneous stock returns over the period under review. The constant term also remains insignificant at a p-value of 0.625.

Synthesizing across the three models, the lagged dependent variables are consistently significant, validating the use of a dynamic GMM approach. While CRFD negatively affects firm value (Model 1) and positively influences market valuation (Model 2), it shows no significant impact on stock returns (Model 3). Notably, the interaction term (CRFD*IO) is positively significant in Models 1 and 2, suggesting that institutional ownership enhances the value relevance of climate-related disclosures, though this effect does not extend to short-term stock performance.

4.4 GMM Post-Diagnostics Tests

To ensure the reliability and consistency of the two-step system GMM estimators, several post-estimation diagnostic tests such as the Arellano-Bond tests for serial correlation, the Hansen and Sargan tests of over identifying restrictions and the Difference-in-Hansen tests were conducted. Collectively, these tests are essential for confirming the internal validity of the GMM specification and avoiding biased or inconsistent parameter estimates. The results are presented in Table 6 Below:

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Table 6:
GMM post-diagnostics Tests

Test	Model 1 (TQ)	Model 2 (MBR)	Model 3 (SR)
Arellano-Bond AR(1)	z = -2.54, p = 0.011	z = -2.99, p = 0.003	z = -0.94, p = 0.350
Arellano-Bond AR(2)	z = 1.24, p = 0.216	z = 1.18, p = 0.237	z = -0.42, p = 0.672
Sargan Test	chi2 = 163.81, p = 0.041	chi2 = 201.87, p = 0.240	chi2 = 144.27, p = 0.257
Hansen Test	chi2= 9.52, p = 1.000	chi2= 9.93, p = 1.000	chi2 = 6.66, p = 1.000
Diff-in-Hansen (GMM levels)	chi2= 0.00, p = 1.000	chi2= 0.00, p = 1.000	chi2= -0.22, p = 1.000
Diff-in-Hansen (Instruments eq(diff))	chi2 = 0.00, p = 1.000	chi2= 0.00, p = 1.000	chi2= -0.12, p = 1.000

Source: Researcher's Computation from STATA 18 (2025)

The Arellano-Bond AR(1) test is significant for Models 1 and 2, as expected, indicating first-order serial correlation in first-differenced errors. More importantly, the AR(2) test is not significant across all models ($p > 0.1$), suggesting no second-order autocorrelation and thus supporting model validity. The Hansen test (robust) yields high p-values ($p = 1.000$), indicating that the instruments used are valid and not over identified, though caution is noted due to the large number of instruments. The Sargan test in Model 1 shows mild concern ($p = 0.041$), but this result is not robust. Lastly, the Difference-in-Hansen tests confirm the exogeneity of instrument subsets across all models, reinforcing the appropriateness of the instruments used in both levels and differenced equations.

4.4 Discussion of Findings

For hypothesis one, the findings indicate that climate-related financial disclosure (CRFD) significantly influences Tobin's Q, supporting the argument that transparent climate reporting enhances firm value among environmentally sensitive companies in Canada. This result aligns with prior studies such as Zhou et al. (2022) and Lins and Servaes (2023), which show that climate-related disclosures reduce information asymmetry and strengthen investor confidence in firm valuation. The significant moderating effect of institutional ownership suggests that firms with active institutional investors benefit from improved disclosure credibility, consistent with Signaling Theory (Spence, 1973), where credible voluntary disclosures send positive signals to capital markets. Institutional investors, due to their sophistication and monitoring capacity, are

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better able to interpret climate-related data, thereby reinforcing its value relevance in market pricing.

Regarding hypothesis two, the study finds a positive and significant relationship between CRFD and the market-to-book ratio (MBR), implying that climate disclosures enhance investor perceptions of intangible value, reputation, and long-term growth prospects. This finding corroborates Dhaliwal et al. (2011) and Hsu et al. (2022), who demonstrate that high-quality ESG reporting attracts sustainability-focused investors and improves firm valuation beyond book equity. Furthermore, the positive moderating effect of institutional ownership supports Agency Theory (Jensen & Meckling, 1976), as institutional investors reduce managerial opportunism and ensure disclosures reflect substantive climate strategies. It also resonates with Stakeholder Theory (Freeman, 1984), given that institutional shareholders often pressure firms to adopt sustainable practices, thereby amplifying the value relevance of CRFD in market-based valuations.

For hypothesis three, the findings reveal no significant relationship between CRFD and short-term stock returns, diverging from studies such as Gu (2023) and Lin and Wu (2023), which report modest price sensitivities to climate-related reporting. This suggests that Canadian markets may treat CRFD as a long-term strategic signal rather than an immediate performance driver, especially where disclosure frameworks remain voluntary or lack standardization. Investors may require credible transition strategies or enhanced comparability before integrating climate information fully into pricing decisions. Nonetheless, the results reaffirm the importance of institutional ownership, which improves the strategic significance of CRFD even if its short-term effects are muted. Consistent with Flammer (2021), the long-term benefits of climate disclosures are likely to materialize through sustained value creation and lower risk perceptions, particularly in environmentally sensitive sectors.

5.0 CONCLUSION

This study examined how climate-related financial disclosure (CRFD) influences firm value in Canada's environmentally sensitive sectors, and whether this relationship is moderated by institutional ownership concentration. The study explored Tobin's Q, market to book ratio (MBR) and stock returns as firm value proxies. The results obtained from the dynamic panel GMM estimation unveiled that CRFD is statistically significant in predicting the behaviour of Tobin's Q and Market to book value. Conversely, CRFD had no significant statistical influence on stock, suggesting that its effect may be less noticeable in short-term market performance or dynamics.

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From the interaction term, CRFD and institutional ownership was statistically significant on both Tobin's Q and MBR confirming that institutional owners indirectly influence the relationship between climate disclosure and firm value in the sectors covered by the study. These outcomes underline the significance of ownership structure in strengthening the valuation effect of sustainability disclosure and suggest that CRFD has far-reaching impact on firm value when there is presence of institutional oversight.

Overall, the study concludes that while CRFD has a measurable and significant effect on firm valuation metrics, its impact is contingent on institutional engagement and does not uniformly extend to short-term stock performance. These insights highlight the need for firms and policymakers to consider both disclosure quality and investor composition when advancing climate transparency initiatives.

5.1 Implication of the Study

The results lend support to signaling theory and agency theory by demonstrating that CRFD influences firm valuation, particularly when reinforced by institutional investor involvement. For practitioners, this underscores the importance of aligning disclosure practices with investor expectations, especially in sectors exposed to environmental risk. From a policy perspective, these findings suggest that regulators should not only encourage climate-related disclosures but also promote institutional engagement to maximize the effectiveness of such disclosures in capital markets.

5.2 Originality

This study addresses a critical research gap by focusing on the underexplored intersection of climate-related financial disclosure (CRFD) and firm value within Canada's environmentally sensitive sectors. While prior studies have examined CRFD in broad, cross-sector contexts, few have explored its valuation effects in high-emission, resource-dependent industries where climate risks are both financially and operationally material. By incorporating institutional ownership concentration as a moderating variable, the study advances understanding of how investor structure shapes the credibility and market impact of climate disclosures. Methodologically, the application of dynamic panel GMM estimation, combined with a structured CRFD index aligned to TCFD and ISSB guidelines, offers a replicable and theory-driven approach for future research. This sector-specific, governance-integrated perspective distinguishes the study from existing literature and provides actionable insights for both policymakers and capital market participants.

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5.3 Limitations of the Study

This study's scope was limited to listed Canadian firms in environmentally sensitive industries, which may restrict the generalizability of the findings across sectors or jurisdictions. Also, the study relied on secondary data, which may not capture numerous reasons behind the motivation for CRFD disclosure.

5.4 Suggestions for Further Studies

Studies could expand the scope to include other high-emission industries or cross-country comparisons to better understand how regulatory context affects disclosure outcomes. Additionally, using mixed methods, including qualitative studies such as interviews with executives of company could yield more insightful information on the driving forces behind CRFD practices and disclosure.

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