Analyzing the Correlation among Net Income & Profit Margins and ESG Ratings for Selected Canadian Energy Sector Companies

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List of Abbreviations

Abbreviation	Definition
CDP	Carbon Disclosure Report
CNRL	Canadian Natural Resources Limited
EIA	Environmental Impact Assessments
ERM	Enterprise Risk Management
EPS	Earnings per Share
ESG	Environmental, Social, and Governance
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
GSIA	Global Sustainable Investment Alliance
HSE	Health, Safety, and Environment
OECD	The Organization for Economic Cooperation and Development
ORM	Operational Risk Management
PRI	Principles for Responsible Investment
R & D	Research and Development
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goals
SRI	Socially Responsible Investment

STEM	Science, Technology, Engineering, and Mathematics
TCFD	Task Force on Climate-Related Financial Disclosures
UN	United Nations
WFE	World Federation of Exchanges

I. The Context

The concept of sustainable investing originated from the socially responsible investment (SRI) movement of the 1960s and 1970s. This movement initially aimed to exclude corporations involved in activities considered immoral or detrimental, like weapons, tobacco, and South Africa during the apartheid-era (Sandberg et al., 2019). Since Environmental, Social, and Governance (ESG) factors have a significant impact on investment performance, the idea has evolved over time to include them. Evaluating a company's environmental impact involves considering areas like waste management, energy efficiency, and carbon emissions. Social factors include aspects like community relations, human rights, and work practices. The structure and transparency of a company's management are components of governance.

Due to investors' growing awareness of the impact of ESG factors on risk and return, there is an increasing demand for sustainable investments. The EU's Sustainable Finance Action Plan is one regulatory attempt that aims to advance sustainability in the financial system and encourage adoption of ESG principles. Corporate leadership plays a significant role as many companies include sustainability in their plans to enhance stakeholder value creation and participation.

There are still issues with ESG data availability and accuracy, including ESG factors in investment decision-making, measuring and disclosing social and environmental consequences. Sustainable investing, on the other hand, offers chances to manage risk, match financial goals with favourable social and environmental consequences, and produce long-term value for investors and society in general in a better manner.

II. Introduction

Sustainable finance, driven by considerations of ESG factors, has gained momentum as investors increasingly seek both financial returns and positive societal and environmental impacts. This strategy aims to achieve long-term benefits while aligning with the values of investors by incorporating ESG considerations into decision-making processes. The three main goals of ESG investing are risk management, portfolio return enhancement, and social issues, including inclusive governance and climate change. Yet, there are still issues in efficiently disseminating ESG data and incorporating it into financial choices. There are still incorrect assumptions about how ESG factors affect financial results, even as investors and financial intermediaries are adopting them more and more in their operations. Even if there is evidence that ESG-oriented investments can improve the societal impact without lowering financial returns, further investigation is required to fully understand how their contributions can lead to value creation over the long term.

Adopting uniform methods internationally is made more difficult by the absence of defined ESG language and protocols. ESG investing methods come in a variety of forms, such as integration with other investment philosophies, portfolio tilting depending on ESG scores, and positive or negative screening. The seamless incorporation of ESG considerations into investing decisions is hampered by issues with materiality, consistency, and uniform disclosures. The Organization for Economic Cooperation and Development (OECD) has been actively involved in advancing sustainable finance and ESG integration through consultations, studies, and guidelines for responsible investing. Significant obstacles still exist, though, such as the requirement for more consistency, transparency, and comprehension of ESG factors by financial consumers. For sustainable finance to fulfill its promise of producing both financial rewards and societal benefits with better results, these issues must be handled.

Thesis Statement

Through recommendations for institutional investors, reports on investment governance and ESG integration and through consultations on ESG factors integration into pension fund management the OECD has played a prominent role in the promotion of these investments. The primary rationale for conducting this study is to determine the relationship between finance and sustainability by investigating investment strategies while giving preference to such practices that are known to give the desired financial returns and positive environmental and social effects (Boffo & Patalano, 2020). The study, being mixed in nature, combines the qualitative and quantitative approaches, and aims to come up with findings that guide investment decisions through the implementation of sustainability investment strategies and the use of sustainable finance mechanisms and products for obtaining greater financial returns over a period. This study takes the afore-mentioned OECD report as a basis for furthering the research and analysis and aims to add value to the finding by focusing specifically on just one industry and one country, namely the energy sector in Canada, particularly.

Even though manufacturing, technology, and natural resources are all strongly connected with the Canadian economy, the energy sector serves as the primary driving force. Utilizing Canada's abundant resources, which include lumber, oil, gold, copper, and gas, sectors like mining, forestry, and oil and gas play significant roles in this industry. The energy sector is continuing to grow as a big contributor to Canada's economy by means of the extraction, processing, and utilization of natural resources for trade, which historically has generated substantial revenue and potential for employment (Webster, 2023). Finally, the study is meant to prove that investing in sustainability not only seems to be the most morally and ethically desirable option but also the most financially sound alternative that offers a chance of obtaining higher risk-adjusted returns in the long run.

Hypothesis

According to the proposed hypothesis, there is a correlation between the ESG ratings and the net income of the companies in the energy sector of Canada, assuming the relationship is linear and considering the limitation of data.

Sustainable Investing Approaches and Strategies

ESG Integration

ESG integration has become the de-facto approach in sustainable investing, as the basic principle is that ESG factors can potentially be the drivers of the financial performance and risk profile of a company (Schramade, 2016). This strategy implies the proactive infusing of ESG considerations into the traditional financial analysis by the virtue of which no investment decisions are made unless ESG aspects are appropriately considered. The ESG analytical part includes the collection of data on ESG from different sources such as the company’s disclosures, ratings by third parties and industry-specific research. Investors' attention is directed at assessing a company's performance against different ESG criteria, including emissions of carbon dioxide, labor standards, diversity in the board, and business ethics (Meng & Shaikh, 2023). Through ESG performance assessment, investors can know the risks and chances of the company, both positive and negative, which have influence on performance of the company for long-term. In addition to that, ESG integration includes the identification of materiality of ESG factors and how they relate to the business activity of the company and economic environment in which the company is. Investors must therefore have to determine which ESG factors are financially material to a company's operations and stakeholders and then identifies how these factors may affect the company's financial performance and competitive positioning (Meng & Shaikh, 2023). It is a challenging monitoring as it is about the ability to see the subtleties of the industry, how it is regulated, and what the expectations of the stakeholders are so that one can see the risks and opportunities which might not be in the financial statements.

The other important part of ESG integration is scenario analysis, this facilitates asset managers to conclude the financial consequences of different sustainability cases on companies' operations and investment opportunities. Conversely, the investors may try to assess the economic effects of climate change rules on companies, interruptions of supply chains and social unrest on the company’s earnings, cash flows and value. Sustainability risk and opportunity scenario analyses contribute to an investor’s decision to invest in a company while the investor monitors the risk-reward profile of his investments. Moreover, communication and engagement with the companies are the important parts of ESG integration, as they allow investors to affect the corporate behavior and the sustainability of its practices through strive for the best changes in the ESG areas (Pursele, 2023). Investors communicate with company managements and board of directors to pursue better ESG outcome, transparency, and disclosure. This engagement requires addressing ESG questions together by listening to specific environmental practices management, human rights policies and executive compensation schemes of investors and stakeholders (Pursele, 2023). For positive interaction, investors push firms to be more sustainable which is not only profitable but also makes their success in the eye of financial and ESG notions.

Impact Investing

However, impact investing is fast becoming a growing trend to improve the environment and social sector and to achieve profitability uniquely, impact investing has a different scope from the traditional philanthropy, which simply gives out donations or grants (Pola Nachyła & Justo, 2024). In contrast, the impact investing invests the capital in companies that can address the social and environmental issues. Impact investors prioritize investments that generate measurable and sustainable social and environmental benefits, such as:

Environmental Sustainability

Investors of impact finance companies fund projects that promote climate sustainability such as renewable energy, energy efficiency upgrades, conservation, and others (Pola Nachyła & Justo, 2024). The aim of the above-mentioned funding programs is to alleviate the issue of climate change, pollution, and preservation of natural ecosystems for investors.

Social Equity

The investors in the impact funds are attracted by projects aimed at promoting social justice and inclusiveness, which focus on low-cost housing, health care accessibility, and education among others. The investment is set to bring the estimated equality, quality of life and economic opportunities to the underprivileged through financial gains to the investors.

Economic Development

The Impact investors are the people who invest in projects and companies that they think stimulate economic development and create work in communities that are not well catered for by the mainstream industry for example, social enterprises community development projects and microfinance institutions (Pola Nachyła & Justo, 2024). The objective is to establish business, augment employment creation, maintain small-scale enterprises and stimulate local economies in the creation of investment opportunities for investors.

Impact investing is founded on the concept of measurable outcomes and accountability, where investors want to establish measurable results and impacts through standardized metrics and reports. It facilitates investors to examine the return of this investment and make the policies of getting the maximum results within the defined time span.

Thematic Investing

The practice of thematic investing is now a popular strategy that makes it possible for the investors to pinpoint the investment opportunities related to ecological themes and mega-trends which are expected to be the driving forces of the world economy in the long run as they transform the ideas into reality. Thematic investors identify emerging trends and invest in companies that are well-positioned to capitalize on these trends, such as:

Clean Energy

The investment theme investors look at companies that operate in green energy production, energy storage technologies, electric vehicles, and smart grid infrastructures. The purpose of such investments is to accelerate the switch to the clean-energy economy, help the countries resolve the dependence on fossil fuels, and reduce the environmental impact of climate change as for one side, and to provide the investors with the financial returns as for the second side.

Sustainable Consumption

Thematic investors invest in companies that rethink the issues of food sustainability production, ethical fashion, sustainable packaging, and circularity. Such initiatives try to increase efficiency and minimize the waste of resources through the adoption of sustainable consumption patterns, circular economy, and the transition to a regenerative economy.

Healthcare Innovation

Thematic investors look for companies who are doing research in health care technology, personalized medicine, and disease prevention, and try to improve the way medicine is delivered (Stefanicka-Wojtas & Kurpas, 2023). These investments are geared towards the provision of quality health services delivery, meeting health care needs and the improvement of overall health outcomes of the public. Furthermore, the investors may also benefit financially from the proceeds of the investments.

A thematic approach gives more opportunities to investors to join industries and sectors where growth is highly desirable, what also contributes to sustainability and responsible innovation. With the presence of business companies which are strongly focused on solving the world's most urgent problems, thematic investors try to obtain admirable results of financial statements and at the same time to create positive social and environmental outcome.

Engagement and Advocacy

With participation and commitment, venture capitalists can impact company practices that support environmental, social, and governance (ESG) challenges. Proactively interacting with businesses to evaluate ESG risks and opportunities is known as stakeholder interaction, and it improves performance and transparency. Meetings with management, attending shareholder meetings, proposing resolutions, and working with stakeholders are examples of engagement mechanisms (Serafeim, 2020).

Entire industry spanning groups are frequently involved in advocacy campaigns. To advance ESG norms, launch initiatives, and manage systemic risks, investors collaborate with associations, legislators, and regulatory agencies. Investors can promote sustainable development at the corporate and systemic levels by active participation (Serafeim, 2020). Investors leverage firms to raise ESG rankings and generate long-term value by increasing ownership. ESG integration, impact investing, advocacy, and other strategies are all part of socially responsible investing, which supports environmental, social, and governance goals in addition to financial ones.

III. Literature Review

A critical analysis of the financial materiality of ESG aspects has been prompted by the growing importance of these concerns in investment discourse, especially in the Canadian energy sector. This industry, which is well-known for having a big influence on the environment and society, has emerged as a key resource for learning how financial performance and environmental concerns connect. Stakeholders in law, regulation, and business are becoming more and more aware of the need to incorporate ESG measures into frameworks for making investment decisions to maximize returns and improve risk management (SASB Standards Overview - SASB, 2023).

Several studies highlight the positive relationship between ESG performance and financial results in different industry including the energy industry (Naeem & Çankaya, 2022). Strong evidence from meta-analyses indicates that businesses with strong ESG policies typically have better stock performance and operational efficiency, among other financial performance measures (Fidelity International, 2021). This relationship is further supported by Halid et al. (2023), which shows how companies in the energy sector that have higher ESG scores outperform industry benchmarks. This trend emphasizes the understanding that resilient and sustainable value generation within the energy industry are directly related to the efficient management of ESG risks and opportunities.

Furthermore, a study conducted recently by Pulino et al. (2022) clarifies how financial resource mobilization in the energy sector is affected by ESG performance. Their results imply that improved access to financial resources is positively correlated with improved ESG performance, suggesting that investors are increasingly directing capital toward businesses with good ESG credentials. Furthermore, Baran et al. (2022) draw attention to how ESG integration promotes resilience and innovation in the energy sector, which helps to ensure long-term financial sustainability.

ESG's financial relevance goes beyond stock markets to include fixed-income assets and more general economic considerations. Initiatives like the UN Principles for Responsible Investment (Pri, 2024) demonstrate the dedication of stakeholders, which highlights the increasing trend of including ESG factors into credit evaluations and more comprehensive investment plans. Furthermore, improvements in data transparency and ESG reporting, as demonstrated by programs like the World Bank's sovereign ESG database, help investors make well-informed decisions when evaluating the sustainability performance of nations in the energy sector (World Bank, n.d.).

The integration of ESG considerations into decision-making processes is prompted by ESG scores, which play a crucial role in enabling investors and market participants to convert ESG disclosure into practical investment products (Tayan et al., 2022). Gaining an understanding of the complexities behind ESG ratings and how they are converted into indices is crucial to comprehending the dynamics of ESG assessment in the financial sector. There are many different approaches used to award absolute and relative scores across sectors, including data selection, metric weighting, and the use of subjective assessment (Tayan et al., 2022). Although there are methodological differences between Bloomberg, Morningstar, and MSCI, the overall goal of ESG ratings is still the same, highlighting businesses that are doing exceptionally well in terms of ESG.

ESG issues are the main criteria used to calculate ESG scores. The relative relevance of each element is determined by the particulars of the industry (Lee & Suh, 2022). Resource depletion, carbon emissions, and sustainability measures are examples of environmental challenges, whereas worker welfare, human rights, and community involvement are examples of social factors.The three main pillars of governance are accounting standards, transparency, and corporate governance practices (Lee & Suh, 2022). Techniques are carefully upheld to guarantee thorough assessments of ESG performance, combining components from every dimension to offer insights into ethical behavior and sustainability practices (Liu et al., 2023). By using these ratings, investors can align their beliefs and investing goals with companies that have similar ESG policies, creating a mutually beneficial interaction between corporations and ESG-aware investors.

Halid et al. (2023) emphasized on how transparency and stakeholder participation are enhanced by ESG reporting. His study added to the understanding of how ESG affects company success, especially in the areas of operations and finance, also highlighting the continuous discussion about the connection between them and the need for more research to reach a consensus.

The study explores the relationship between ESG performance and corporate value and profitability, revealing some notable positive relationships, particularly related to Social and governance elements, which may be linked to long-term impacts and higher costs. These findings highlight the importance of ESG for all parties involved, pointing to possible competitive benefits for businesses that perform better than expected especially in times of crisis and suggesting directions for future research that look at the variables influencing ESG's impact on financial performance (Aydoğmuş et al., 2022).

IV. Methodology

Qualitative Method

A questionnaire was created and distributed to provide a qualitative assessment in addition to the quantitative analysis. Despite efforts to receive responses from different individuals across the author's network, the response rate was very limited, with feedback received from only two people. Even though the sample size was lower than expected the information these respondents shared was extremely valuable. Their viewpoints and criticisms contributed insightful qualitative information that deepened my understanding of the subject matter and revealed ambiguities about the research design, conclusions, and its ramifications. Though getting a larger sample size can be difficult, the input from these people makes the analysis more comprehensive by guaranteeing that the research process considers both qualitative and quantitative notions.

The filled questionnaires are mentioned below.

Questionnaire 1

Questionnaire for Sustainable Investing and ESG Perceptions

I appreciate you taking the time to complete my sustainable investing survey. I will learn more about the connection between financial performance and sustainable investment strategies thanks to your replies. Please provide the most accurate response you can to the following questions.

Personal Information

Name: Afshin Doust

Contact Number and/or Email: adoust@gmail.com

Designation: Founder

Organisation: Hera Investment Funds

Location: North Vancouver, BC, Canada

Sustainable Investment Experience:

To what extent do you understand the idea of sustainable investing?

☑ Very Familiar

☐ Somewhat Familiar

☐ Not Very Familiar

☐ Not Familiar at all

Have you personally participated in ESG-related decision-making or sustainable investing inside your company?

☑ Yes

☐ No

Investment Decision Making

What aspects do you think are most crucial when choosing an investment? (Choose up to 3)

☑ Financial Returns

☑ Environmental Impact

☑ Ethical Factors

☐ Governance

☑ Legal & Regulatory Practices

☐ Social Concerns

☐ Others (Please Specify):

Opportunities and Challenges of Sustainable Investing

What hurdles do you think stand in the way of effectively applying sustainable investment strategies into execution?

Knowledge and proper identification of opportunities.

Are there some specific benefits or possibilities that you connect with sustainable investing? Tell me more about it, please.

Sustainability of the investments and impact driven strategies which help align goals with societal impact create buy in from all stakeholders and create win win situations for fund managers, investors, and society as a whole.

Reporting and Data

How do you obtain and apply reporting and data on sustainability to your investment choices?

We measure sustainability based on carbon footprint measurement and fund sustainability.

Do you think any standards or frameworks for sustainability reporting can be helpful for evaluating the sustainability performance of a business? For example, GRI, TCFD, SASB, and CDP

Yes, they can all be useful if used in the right opportunity.

Additional Information

What other thoughts or observations do you have about the relationship between sustainable investing and financial performance?

They go hand in hand and help each other.

Thank you for taking the time to respond to my questionnaire. I will use your answers for my further study of sustainable investing. I am grateful for your participation. Please don't hesitate to get in touch with me if you have any more suggestions or would like to offer more details.

Questionnaire 2

Questionnaire for Sustainable Investing and ESG Perceptions

I appreciate you taking the time to complete my sustainable investing survey. I will learn more about the connection between financial performance and sustainable investment strategies thanks to your replies. Please provide the most accurate response you can to the following questions.

Personal Information

Name: Raul Ojeda

Contact Number and/or Email: raul.gabriel@myucwest.ca

Designation: Sessional Faculty / FNCE 630: Sustainability and Finance Course Leader

Organisation: UCW

Location: Vancouver, BC

Sustainable Investment Experience:

To what extent do you understand the idea of sustainable investing?

☑ Very Familiar

☐ Somewhat Familiar

☐ Not Very Familiar

☐ Not Familiar at all

Have you personally participated in ESG-related decision-making or sustainable investing inside your company?

☐ Yes

☑ No

Investment Decision Making

What aspects do you think are most crucial when choosing an investment? (Choose up to 3)

☑ Financial Returns

☑ Environmental Impact

☐ Ethical Factors

☐ Governance

☐ Legal & Regulatory Practices

☑ Social Concerns

☐ Others (Please Specify):

Opportunities and Challenges of Sustainable Investing

What hurdles do you think stand in the way of effectively applying sustainable investment strategies into execution?

I don’t have much experience with poor execution of sustainable investment strategies, so I can’t really comment on this. Without any proper evidence, my intuition tells me that failure in execution may be caused by lack of proper measurability (numbers, metrics, indicators, etc.) of the ‘S’ and ‘G’ factors when using the ESG framework.

Are there some specific benefits or possibilities that you connect with sustainable investing? Tell me more about it, please.

Yes, many benefits from the environmental and social side, obviously, but many possibilities in terms of financial returns and profitability as well, just looking at how much momentum ESG has gained in recent times, from large financial institutions (including systemically important banks) to institutional investors and asset managers.

Reporting and Data

How do you obtain and apply reporting and data on sustainability to your investment choices?

For listed companies (like financial institutions, for example) the main sources would be SASB disclosure reports, annual reports, ESG reports, etc.

Do you think any standards or frameworks for sustainability reporting can be helpful for evaluating the sustainability performance of a business? For example, GRI, TCFD, SASB, and CDP

Yes. In terms of measurability of sustainability risks (particularly the ‘S’ factors of the ESG framework), SASB would be the most helpful, as it provides metrics that are relevant to the industry that a company is sitting within.

Additional Information

What other thoughts or observations do you have about the relationship between sustainable investing and financial performance?

My hypothesis is that there is a positive correlation between them. It would be very interesting if, as part of your research, you were able to collect financial data from sustainable and non-sustainable investments and make a quantitative assessment of that hypothesis (a significant relationship between higher levels of sustainability and higher financial returns). Without having tested that hypothesis myself, based on my observations of what BlackRock and other large asset managers are doing, there is a massive shift towards ESG investing, so I am guessing high financial returns are definitely there.

Thank you for taking the time to respond to my questionnaire. I will use your answers for my further study of sustainable investing. I am grateful for your participation. Please don't hesitate to get in touch with me if you have any more suggestions or would like to offer more details.

Quantitative Analysis

Data

For this research, the top 10 Canadian energy corporations ESG scores were obtained from the S&P Global website for the year 2023 (Carpenter, 2022), (*Sustainable1 Solutions: ESG Scores | S&P Global*, n.d.). The primary parts of an ESG score are Environmental (E), Social (S), and Governance (G). These criteria evaluate how well a company performs with regards to sustainability and ethical standards. Furthermore, financial data for the year 2023 was taken over from Yahoo Finance website, which includes the profit margins and net income available to common shareholders (*Yahoo Is Part of the Yahoo Family of Brands*, n.d.).

These measures provide information about the performance and financial well-being of the companies under study. It is important to mention that the analysis was limited to one year of data because only the ESG scores for the current year i.e., 2023, were available.

Methodology for Quantitative Analysis

Correlation and regression analysis were used to examine the relationship among the financial variables where the dependent variables i.e., net income available to common shareholders & profit margins and ESG scores which is the independent variable. To investigate the direction and extent of a linear relationship between ESG scores and net income & profit margins, Pearson correlation coefficients was computed using Microsoft Excel.

In addition, a regression model based on the independent variable of ESG ratings was built, assuming linearity, to forecast the financial performance measures. The coefficients of the linear equation were calculated using the regression from Data Analysis option in Microsoft Excel, which sheds light on the relationship between ESG scores and financial performance measures. The values of R, which is the correlation coefficient, p-values, R-square values are generated when the regression option in data analysis is chosen. This is performed for each of the variables i.e., with net income & profit margins separately. With the data, then a scattered graph is also created with the trendline which is linear and has the equation and R-square value on the graph.

Limitations of the Research

- The Research paper's on a single year's data might not fully encapsulate the wider trends in ESG ratings and financial performance. The sample size is a little small, as the analysis includes only 10 companies in the energy industry. More statistical power and possibly more accurate estimates of the correlation between the ESG score and profit margin could be obtained with a bigger sample size.

- The assumption of a linear relationship between ESG ratings and net income/profit margin could oversimplify their intricate interplay, potentially missing out on subtle dynamics.
- Despite considering a range of factors, the research might still miss out on key variables beyond ESG ratings and financial metrics. The analysis did not cover all potential variables that could affect net income and profit margin. Leaving out important factors could affect the coefficient estimates and have an impact on how the results are interpreted.
- The foundation of this study is regression analysis, but any deviation from its fundamental assumptions could impact the precision of the findings.
- Finally, while the results provide insights into the correlation between ESG ratings and financial metrics, their applicability to wider contexts might be constrained by the specific nature of the data and the period analyzed.

V. Results and Discussion

The Main Data gathered for the purpose of this study is as follows:

Sl No	Name of the Company	Net Income (In Billion)	Profit Margin	ESG Score	Environmental	Social	Governance & Economic
1	Enbridge Inc	5.84	3.20%	56	45	62	62
2	Canadian Natural Resources Ltd	8.23	8.58%	46	52	48	38
3	TC Energy Corporation	2.83	3.56%	48	43	39	62

4	Suncor Energy Inc	8.30	6.95%	49	44	53	51
5	Cenovus Energy	4.07	6.16%	49	41	50	56
6	Imperial Oil	4.89	9.10%	37	41	38	31
7	Pembina Pipeline Corporation	1.65	4.11%	45	46	43	46
8	Tourmaline Oil	1.74	10.31%	43	46	31	49
9	Cameco	0.36	1.65%	38	40	33	41
10	Arc Resources	1.60	10.71%	40	41	36	42

Note. The data in this table are derived from "Stock lookup" by Yahoo! Inc. (n.d), retrieved from https://ca.finance.yahoo.com/lookup and "ESG Scores" by Sustainable1 Solutions (n.d.), retrieved from https://www.spglobal.com/esg/solutions/data-intelligence-esg-scores. The table was created by the author.

The above data has the Net Income available to common shareholders, profit margins and ESG scores for the ten energy companies in Canada for the year ended 2023, which were used for generating further regression and correlation results.

Correlation Results

The summary of the results of correlation of the two parameters considered are mentioned in the table below.

Result of Correlation				
Variables	**R Value**	**R-Square Value**	**P-Value**	**Regression Equation**
Net Income & ESG Score	0.4967	0.2468	0.1441	Y = 1.0254X+41.049
Profit Margin & ESG Score	0.1648	0.0272	0.6491	Y = -0.0024X+0.2958

Firstly, let us see the Correlation results conducted between the Net Income available to common shareholders and ESG scores.

SUMMARY OUTPUT

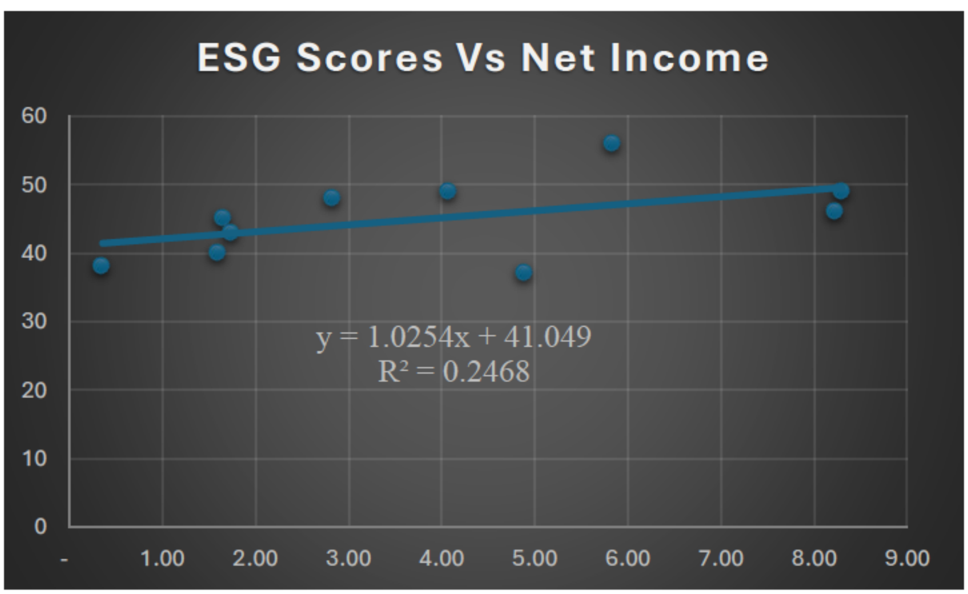
Regression Statistics	
Multiple R	0.4967
R Square	0.2468
Adjusted R Square	0.1526
Standard Error	2.5956
Observations	10

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	17.6550	17.6550	2.6206	0.1441
Residual	8	53.8951	6.7369		
Total	9	71.5501			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Net Income (Y)	-6.9015	6.7540	-1.0219	0.3368	-22.4762	8.6731	-22.4762	8.6731
X Variable - ESG Score	0.2406	0.1486	1.6188	0.1441	-0.1021	0.5834	-0.1021	0.5834

Figure 1:



Note. From primary data collection, a chart was created by the author using *Microsoft Excel.*

An R-value of 0.4967 was determined from the correlation study comparing Net Income available to common shareholders to ESG scores according to figure 1, suggesting that there is a positive correlation among the two variables. Changes in ESG scores can account for nearly twenty-five percent of the variation in Net Income, according to the R-square value of 0.247.

The regression equation Y = 1.0254X+41.049 depicts that for every unit increase in the ESG score, the Net Income increases by 1.0254 units. The p-value of 0.144 isn't low enough to confidently say there's a significant relationship. It's hinting that there might not be a strong statistical connection between the variables. A linear graph has also been created for a better understanding, refer *figure 1*.

Now, let us investigate the Correlation results conducted between the profit margins and ESG scores.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.1648
R Square	0.0272
Adjusted R Square	-0.0944
Standard Error	0.0889
Observations	10

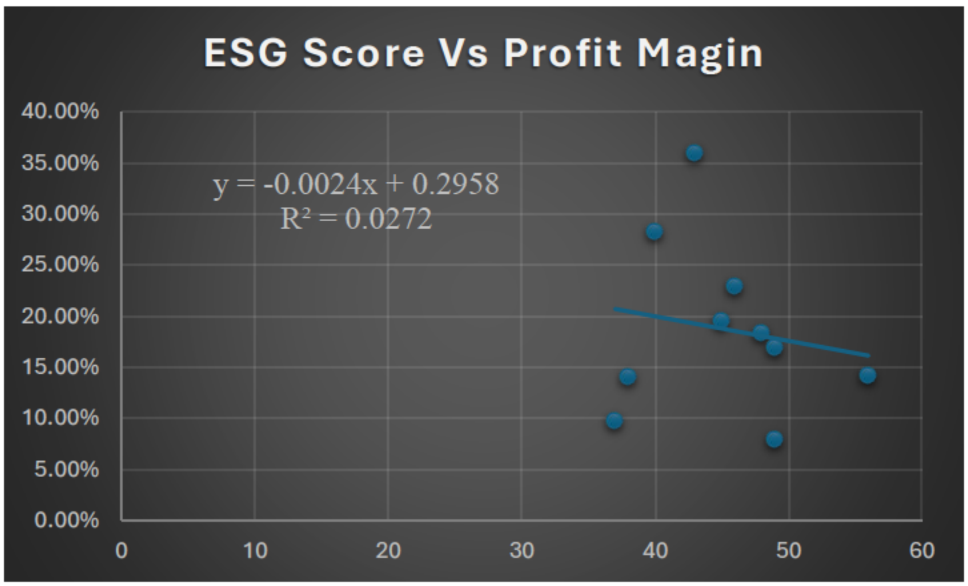
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.0018	0.0018	0.2234	0.6491

Residual	8	0.0632	0.0079
Total	9	0.0650	

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Profit Margin (Y)	0.2958	0.2313	1.2791	0.2367	-0.2375	0.8291	-0.2375	0.8291
X Variable – ESG Score	-0.0024	0.0051	-0.4727	0.6491	-0.0141	0.0093	-0.0141	0.0093

Figure 2:



Note. From primary data collection, a chart was created by the author using *Microsoft Excel*.

The correlation between the independent variable (ESG score) and the dependent variable (profit margin) is weakly positive, as indicated by the multiple R value of 0.1648. This implies that there may be a small, but weak, association between profit margins and rising ESG scores.

The R-squared value is 0.0272, meaning that changes in ESG scores may account for about 2.72% of the variation in profit margins. Taken otherwise, only a small percentage of the variation in profit margins can be explained by the ESG score.

The regression equation Y = -0.0024X+0.2958 depicts that for every unit increase in the ESG score, the profit margin decreases by 0.2958 units. The null hypothesis that the coefficient is equal to zero, suggesting that the ESG score has no effect on profit margin, is tested using the p-value connected to the independent variable's (ESG score) coefficient.

The ESG score coefficient in this instance has a p-value of 0.6491. The null hypothesis cannot be rejected due to insufficient evidence, as indicated by a p-value greater than 0.05. This implies that, at the 0.05 significance level, the ESG score is not statistically significant in estimating profit margins. A linear graph has been created for better understanding of the above, refer *figure 2.*

VI. Recommendations and Conclusions

Even while the research shows that ESG scores and financial performance measures like net income and profit margin are positively correlated, some of these connections might not be statistically significant. Though the hypothesis is proved right through net income to an extent, because of the limitation of data, the profit margin reacted differently. Expanding the sample size or considering other factors could be part of a future investigation to improve statistical robustness of the findings.

The study assumes that financial performance measures and ESG scores follow a linear relationship. It's possible, although, that the relationship is non-linear or shows thresholds, above which further advancements in ESG might not have a major influence on financial results. To capture more complex linkages, non-linear modeling strategies could be investigated in future studies.

While the Canadian energy industry is the research's primary emphasis, other industries might show differing levels of sensitivity to ESG concerns. To gain a deeper understanding of how ESG performance affects financial results in various businesses and subsectors, more study may incorporate sector-specific assessments. The study only uses data from 2023, which makes it difficult to evaluate how ESG performance affects financial measures over the long run. Studies that follow changes in financial performance and ESG scores over time may shed light on how durable and sustainable the connections found are.

The report ignores other important ESG aspects including supply chain management, diversity and inclusion, and ethical sourcing in the interest of concentrating solely on environmental, social, and governance issues. Future studies could examine how these additional ESG aspects affect organizational performance and investment decisions, as well as how financially significant they are.

Comparative research assessing various countries or regions might shed some light into the ways that market dynamics, cultural norms, and legal frameworks affect the connection between ESG and financial performance. It may be possible to identify excellent practices and areas for improvement by comparing Canadian energy corporations with their foreign competitors.

Future research may enhance our comprehension of the financial significance of ESG factors in the energy sector by addressing these suggestions. This will help develop investment strategies that give priority to sustainability and long-term value.

In conclusion, the study demonstrates a positive correlation between the financial performance of Canadian energy companies and their performance with respect to ESG scores. On an overall basis, companies with higher ESG ratings have better financial results. However, further research is necessary to fully understand these results and to determine the ways in which various elements interact and grow over time.

This study pointed out how important it is to take ESG considerations into account when making financial decisions. It implies that incorporating sustainability into investing strategies promotes value creation and long-term sustainability in addition to improving financial results. Nevertheless, further study and analysis are required to completely comprehend these dynamics and provide guidance for responsible investing strategies. Investors and businesses can help promote good social and environmental change and enhance financial performance in the field of sustainable finance by addressing these gaps and adopting a holistic approach to sustainability. It is hoped that the findings of this study will help to contribute positively to growing body of useful literature on the convergence of finance and sustainability in relation to investment strategies.

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