THE IMPACT OF WORKFORCE PRACTICES ON FIRMS' SUSTAINABILITY PERFORMANCE: AN EMPIRICAL STUDY OF CANADIAN LISTED FIRMS

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Abstract

This study examines the impact of workforce practices on firms' environmental and social performance. The mediating impact of firms' financial performance and the moderating impact of firm age on workforce practices and environmental/social performance are also investigated. Data were collected through the Refinitiv database from a sample of 224 large, actively traded Canadian firms listed on the Toronto Stock Exchange (TSX). A linear regression model was used to test the effect of various workforce practices on firms' environmental and social performance. The findings have important implications for the direct and indirect impacts of workforce practices on firms' environmental and social performance. While the direct impact was found to be significant, firms' financial performance was found to fully mediate the workforce-environment/social performance relationship. The findings also demonstrated that the impact of firm age on workforce practices and environmental/social performance via financial performance was significant. The study draws on the signaling theory to empirically investigate the contextual aspects that affect the association between various workforce practices and firms' sustainability performance. The findings can be utilized by firms to select the right mix of practices to tailor workforce management and achieve better sustainability performance in their environmental and social initiatives.

Keywords: Workforce Practice, Corporate Financial Performance, Environmental Performance, Social Performance, Signaling Theory

Authors' individual contribution: Conceptualization — M.M.T.B. and M.O.W.; Methodology — M.M.T.B. and M.O.W.; Formal Analysis — M.M.T.B. and S.G.; Writing — Original Draft — M.M.T.B.; Writing — Review & Editing — M.M.T.B., S.G., and M.O.W.; Visualization — M.M.T.B. and S.G.; Supervision — M.M.T.B., S.G., O.W., and M.O.W.

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1. INTRODUCTION

Globalization since the early 1990s has led to a change in the business environment. The business world has become characterized by technological disruption and abrupt economic turmoil. The market has been evolving and changing, resulting in frequent upheavals (Cartwright, 2021). Such change includes

the fact that in both industry and academia, machine learning, artificial intelligence and big data have taken the lead (Ritala et al., 2022). Organizations strive to cope with this erratic and fluctuating business environment (Mamédio et al., 2019) and to develop competitive business tactics (Farida, 2022). Shifting business strategies exert influence on firms' performance. Pioneering research on business strategy and research that constitutes the basis of business strategic analysis has scrutinized the influence of business strategy on firm performance (Goll et al., 2008). Firms are continuously searching for new ways to enhance performance and gain a competitive edge, while workforce practices offer an approach that firms can use to improve performance (Curtis, 2022) and comprise rules and regulations that firms put in place to improve employee working conditions (Cornwel et al., 2021). These practices can ensure high safety standards or enhance productivity by standardizing work and flows, thus positively impacting a firm's performance. For example, firms like Toyota, Boeing, and many others implemented the Lean Six Sigma (LSS) approach to improve their performance. The LSS process focuses on waste disposal (elimination of unnecessary procedures and processes) to standardize work and flows (Schonberger, 2008). Therefore, in recent decades, such workforce practices have become powerful processes for demonstrating a firm's performance.

As research in workforce practices matures, academics must move beyond simply justifying practices. They need to better understand how these practices affect various aspects of business performance, such as the financial, environmental, or social aspects (Lee & Kim, 2020). Some academics have begun to refine their understanding of workforce practices by utilizing signaling theory (Lin et al., 2022). Signaling theory was first developed to explain ambiguity in workforce practices. Spence's (1974) findings suggest that a firm's profitability may be hindered by a lack of information about unobservable workforce practices. The signaling function of information symmetry distinguishes high-quality employees from low-quality employees. Spence's (1974) study led to a significant amount of scholarship that utilized signaling theory in management research, including corporate governance (Bae et al., 2018), entrepreneurship (Bafera & Kleinert, 2022), strategic management (Suazo et al., 2009), and business reporting (Hahn & Reimsbach, 2021). The signaling theory perspective in business management is supported by these studies; however, workforce practices have been treated as a single set of practices. While academics have treated workforce practices as a single set of universal practices that do not allow for customization, several studies have highlighted the significance of customization. Guest et al. (2021) begin to theorize that workforce practices have a focus on both control and affect and that different contextual settings require different workforce practices.

Growing awareness of the influence of workforce practices on financial results and mounting stakeholder demands for environmental and social performance drive the increasing frequency of sustainability initiatives (Lopez-Cabrales & Valle-Cabrera, 2020). For instance, current environmental gains have been offset by unsustainable trends in global consumption of natural resources, requiring more robust workforce practices to deal with the change in the natural balance (Li & Yeo, 2021). Firms must comprehend how to enhance workforce practices to maximize their sustainability value (Ogunyemi & Laguda, 2016), and a one-size-fits-all approach to workforce sustainability practices may not yield optimum results. Different firms may require different approaches to optimally utilize workforce practices to achieve higher sustainability performance. For instance, is it appropriate for a commodity-based manufacturer to use the same workforce practices as a high-tech manufacturer? The aim of this study is to analyze how firms differ in their workforce practices and the effect of these choices on sustainability performance. Therefore, the focus of this study is on various workforce practices that can improve the environmental and social performance of firms.

This research draws on signaling theory, which can be used as a starting point to empirically investigate the contextual aspects impacting the relationship between various workforce practices and firms' sustainability performance. This paper builds on the signaling argument and empirically tests the influence of four different contextual workforce practices impacting firms' environmental and social performance. These four orientations or types of workforce practices include: 1) diversity and opportunity, 2) employment quality, 3) health and safety requirements, and 4) training and development. *Diversity and opportunity* involve ensuring that people from diverse backgrounds are culturally and socially accepted and integrated into the workforce (Armstrong et al., 2010). *Employment quality* demonstrates the social and economic progress of workers and provides them with a sense of identity, but it could also pose risks to their well-being (Gallie, 2007). *Health and safety* requirements identify and prevent hazards that could cause injury, mental and physical illness, and fatalities at work (Vujica-Herzog & Harih, 2020). *Training and development* is a term that refers to educational activities that are conducted within a firm to improve the knowledge and skills of employees while providing information and instructions on how to improve the performance of specific tasks (Scheel et al., 2014).

This research marks the first empirical study to differentiate workforce practices into four separate yet related bundles. The paper contributes to the signaling perspective of business management, and empirically addresses the research question:

RQ: How can firms adapt different contextual workforce practices to achieve better environmental and social performance?

The findings have a direct impact on firms in supporting their choice of the right mix of practices to tailor workforce management and achieve better sustainability performance for their environmental and social initiatives.

The remainder of the paper is organized as follows. Section 2 considers the theoretical foundations of the proposed model, as well as the specification of key variables and the formulation of hypotheses. Section 3 describes the research method and empirical data collected for the study. Section 4

presents the data analysis and results. Section 5 presents the discussion of the results. Finally, Section 6 presents the conclusions of the study and some recommendations for future research.

2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1. Research framework

Signaling theory can be a helpful tool in identifying different orientations of workforce practices and examining their impact on a firm's sustainability performance. According to Bergh et al. (2014), signalers are those who are insiders (such as managers) who gather information about people, products, or organizations (Spence, 1974; Ki & Kim, 2022; Brown et al., 2020), that is not available to outsiders. The researchers define receivers as outsiders who have no knowledge about the firm in question but are interested in receiving it. Mavlanova et al. (2012) state that there is information asymmetry between signalers and receivers; the signalers' information is better than the receivers' information. Signaling theory focuses on reducing information asymmetries between signalers and receivers by depicting their behavior when they have access to different pieces of information (Spence, 1974). Signalers have the responsibility of deciding when and how to signal information, and receivers have the responsibility of interpreting that signal (Bokek-Cohen, 2018). Using this theoretical premise, the signal given by superior workforce practices cannot be replicated by inferior workforce practices, in what is known in economics as a separating equilibrium.

Spence's (1974) example suggests that effective workforce practices are a reliable indicator of a firm's performance, based on two assertions: 1) effective workforce practices can improve a firm's performance, and 2) inferior workforce practices cannot be disguised as superior workforce practices. Three categories can be used to categorize the signal for workforce practices: intent, camouflage, and need (Albertini, 2019). Intent signals are used to indicate future actions when a rival initiates a competitive action. In such a scenario, a firm may indicate its determination to improve its workforce practices (Schüler et al., 2023). Camouflage signals conceal a possible obligation for the workforce by deflecting attention from a possible susceptibility. For example, firms that encourage diversity in their workforce demonstrate legitimacy by including backgrounds, ideas, and beliefs to divert attention from the responsibility for workforce discrimination (Tuo et al., 2020). Need signals are used to indicate communication requirements to the receiver. For instance, managers signal their need for funds and resources to improve various workforce practices, and the owner decides which signals the greatest need in terms of improving the firm's performance (Mishra, 2013).

According to signaling theory, workforce practices, such as "diversity and opportunity", can be used as signaling devices to inform a firm's sustainability performance (Spence, 1974). Similarly, Greening and Turban (2000) find that companies tend to improve their workforce practices with the help of superior financial performance, confirming that financial performance is used by insiders in firms to communicate the superior quality of their workforce practices. Based on signaling theory, Gupta (2021) argues that profitable firms differentiate themselves from less profitable firms by generating a positive relationship between workforce practices and sustainability performance. Likewise, Vesal et al. (2021) developed a hypothesis about the relationship between workforce practices and sustainability performance based on signaling theory: they found that effective workforce practices led to a firm's higher sustainability performance.

Firms communicate their seriousness regarding environmental and social sustainability to financial markets through various workforce practices, and the signaling theory perspective helps address information asymmetry regarding workforce practices (Courtney et al., 2017). The present study hypothesizes four different types of workforce practices — diversity and opportunity, employment quality, health and safety, and training and development — and investigates their direct effect on the environmental and social performances of firms. This study explores the mediating effect of financial performance on the relationship between workforce practices and the environmental and social performances of firms. This study also examines the moderated mediation effect of firm age, firm size, and industry type on the environmental and social performance of firms.

2.2. Environmental performance of firms and workforce practices

Sharma et al. (2020) demonstrated a positive impact of workforce practices on environmental performance. A positive association between workforce practices and environmental performance has also been shown by a series of scholars (Dal Maso et al., 2020; McCarty, 2011; Nisar et al., 2022). In contrast, Arimura et al. (2021) observe that workforce practice measures are unrelated to the firm's environmental performance.

The firm's commitment to environmental sustainability improves in the presence of workforce practices (Ahmed et al., 2019). It has been shown that workforce practices could enhance environmental initiatives taken up by firms, which improves the long-term benefits of firms' environmental performance (Van Tiem et al., 2012). Investors, for instance, take into account a firm's perception of workforce practices (Martínez-del-Río et al., 2023). Meuer (2017) studied workforce practices in the context of the UK, where they found that workforce practices are, to varying extents in different firms, generally a strategic priority. Such a strategic priority helps managers improve their firms' environmental sustainability. However, Suganthi (2019) made contradictory observations in which no impacts of workforce practices were documented on environmental sustainability.

We developed our hypotheses based on the above arguments regarding environmental sustainability in favor of workforce practices and the signaling theory's proposition that firms send signals about environmental sustainability via their strategic priorities and actions concerning workforce practices.

2.2.1. Direct effect of workforce practices on environmental performance of firms

The first hypothesis (*H1*) concerns the impact of workforce practices on a company's environmental performance. Firms will perform better environmentally if they possess superior workforce management capabilities, according to effective workforce practices, compared to ineffective workforce practices that lack these capabilities (Ahmed et al., 2019). These firms are more capable than their competitors of generating and disseminating environmental information, sensing environmental capabilities, and responding to changing environmental regulations. For instance, the effectiveness of these firms' workforce practices facilitates the identification of comprehensive environmental solutions, which in turn contribute to the measurement, monitoring, and reporting of carbon emissions. Firms can learn faster than their competitors by combining effective workforce practices with environmental sensing capabilities. These practices and capabilities can be fused to develop innovative environmental solutions, introduce new green products or processes to the market, and improve a firm's environmental performance. As a result, the following main hypothesis (*H1*) and its sub-hypotheses are tested:

H1: Workforce practices are positively correlated to the environmental performance of firms.

H1a: Diversity and opportunity in the workforce are positively correlated to the environmental performance of firms.

H1b: Employment quality in the workforce is positively correlated to the environmental performance of firms.

H1c: Health and safety requirements in the workforce are positively correlated to the environmental performance of firms.

H1d: Training and development in the workforce are positively correlated to the environmental performance of firms.

2.2.2. Mediating effect of financial performance on the relationship between workforce practices and environmental performance of firms

Firms' financial performance is responsible for the relationship between workforce practices and environmental performance, which is mainly influenced by signaling theory and the study setting (Visvizi, 2022). Therefore, the underlying steps that impact workforce practices on environmental performance through the financial well-being of a firm are quantified using a mediator variable, which is the firm's financial performance.

H2: The financial performance of firms mediates the relationship between workforce practices and the environmental performance of firms.

H2a: The financial performance of a firm mediates the relationship between diversity and opportunity in the workforce and the firm's environmental performance.

H2b: The financial performance of a firm mediates the relationship between employment quality in the workforce and the firm's environmental performance.

H2c: The financial performance of a firm mediates the relationship between health and safety requirements in the workforce and the firm's environmental performance.

H2d: The financial performance of a firm mediates the relationship between training and development in the workforce and the firm's environmental performance.

2.2.3. Moderated mediation effect of firm age on the environmental performance of firms

Firm age is hypothesized to influence workforce practices and is relevant in the context of moderating the financial performance mediation relationship between workforce practices and firm environmental performance. This is because younger firms might play a more pronounced role in channeling the effects of workforce practices on environmental performance. Hence, the next hypothesis (and its sub-hypotheses) is based on this argument:

H3: The firm age moderates the mediating relationship of financial performance between a firm's workforce practices and its environmental performance.

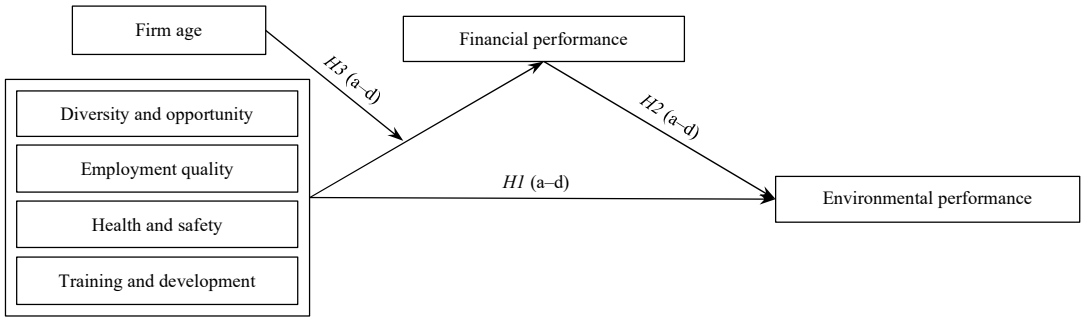
H3a: The firm age moderates the mediating relationship of financial performance between diversity and opportunity in the workforce and the firm's environmental performance.

H3b: The firm age moderates the mediating relationship of financial performance between employment quality in the workforce and the firm's environmental performance.

H3c: The firm age moderates the mediating relationship of financial performance between health and safety requirements in the workforce and the firm's environmental performance.

H3d: The firm age moderates the mediating relationship of financial performance between training and development in the workforce and the firm's environmental performance.

Figure 1. Research Model A



Note: Research Model A is a moderated mediation model exhibiting the direct impact of workforce practices, mediating effect of financial performance, and moderating effect of firm age on the environmental performance of firms.

2.3. Social performance of firms and workforce practices

The association between social sustainability and firms' workforce practices has been studied by Greening and Turban (2000); and some studies have found a positive relationship between social measures and workforce practices (Chambost et al., 2019; Newman et al., 2015; Reverte et al., 2016). A study by Nirino et al. (2021) also reported a negative relationship between the two constructs; however, González-Rodríguez et al. (2019) reported only a partial association. Furthermore, Beji et al. (2021) studied the impact of the diversity dimension of workforce practices on social performance, and Johanson et al. (2022) demonstrated a positive relationship between social sustainability and the firm's health and safety practices. As discussed, firms (from a signaling perspective) send signals through effective workforce practices for their competitive advantage and thereby create value for all stakeholders via their social efforts and initiatives (Bergh et al., 2014). Under this theoretical proposition based on relationships between social sustainability and the firm's social performance, we develop the hypotheses in the sections below.

2.3.1. Direct effect of workforce practices on social performance of firms

The fourth hypothesis (*H4*) examines the impact of workforce practices on a firm's social performance. Effective workforce practices are predicted to have a positive impact on social performance. The heterogeneity of social responses and the impacts of certain pressures can be discerned through consideration of workforce influences on firms that operate within a complex structure. In addition, how workforce norms influence social performance can be examined using signaling theory (Bae et al., 2018) because operationalizing social performance can be based on decisions beyond traditional profit maximization (Valmohammadi, 2014), and without effective workforce practices, managers may not be able to commit their firms to socially responsible activities. Through effective workforce management, the signaling perspective has the potential to alleviate some of the concerns associated with achieving higher social performance. As a result, the following hypotheses are tested:

H4: Workforce practices are positively correlated to the social performance of firms.

H4a: Diversity and opportunity in the workforce are positively correlated to the social performance of firms.

H4b: Employment quality in the workforce is positively correlated to the social performance of firms.

H4c: Health and safety requirements in the workforce are positively correlated to the social performance of firms.

H4d: Training and development in the workforce are positively correlated to the social performance of firms.

2.3.2. Mediating effect of financial performance on the relationship between workforce practices and social performance of firms

Firms' financial performance is responsible for the relationship between workforce practices and social performance, which is mainly influenced by signaling theory and the study setting (Reverte et al., 2016). Hence, the underlying steps that impact workforce practices on social performance through the financial well-being of a firm are quantified using a mediator variable, which is a firm's financial performance.

H5: The financial performance of firms mediates the relationship between firms' workforce practices and social performance.

H5a: The financial performance of a firm mediates the relationship between diversity and opportunity in the workforce and the firm's social performance.

H5b: The financial performance of a firm mediates the relationship between employment quality in the workforce and the firm's social performance.

H5c: The financial performance of a firm mediates the relationship between health and safety requirements in the workforce and the firm's social performance.

H5d: The financial performance of a firm mediates the relationship between training and development in the workforce and the firm's social performance.

2.3.3. Moderated mediation effect of firm age on the social performance of firms

The age of the firm is important in influencing the relationship between their performance, workforce practices, and social performance. This is because younger firms might play a more pronounced role in channeling the effects of workforce practices on social performance. Hence, we derive the following hypotheses as:

H6: The firm age moderates the mediating relationship of financial performance between firms' workforce practices and social performance.

H6a: The firm age moderates the mediating relationship of financial performance between diversity and opportunity in the workforce and the firm's social performance.

H6b: The firm age moderates the mediating relationship of financial performance between employment quality in the workforce and the firm's social performance.

H6c: The firm age moderates the mediating relationship of financial performance between health and safety requirements in the workforce and the firm's social performance.

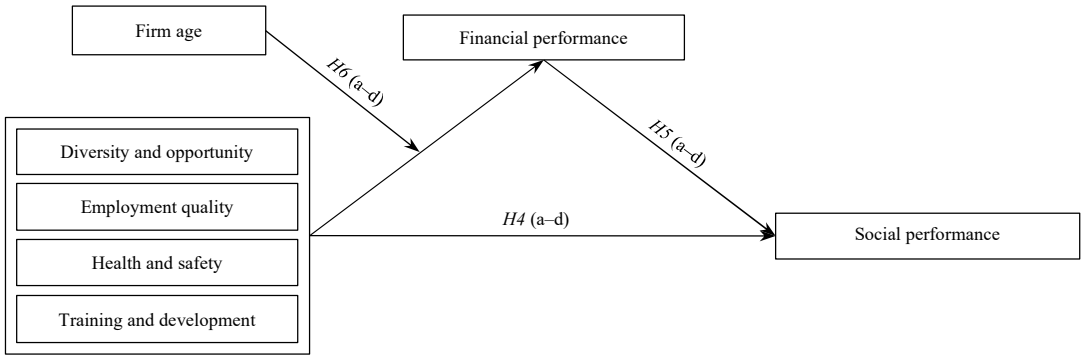
H6d: The firm age moderates the mediating relationship of financial performance between training and development in the workforce and the firm's social performance.

3. RESEARCH METHODOLOGY

3.1. Sample

Canada serves as the focus of this empirical investigation. We concentrate on a representative sample of large and actively traded Canadian firms listed on the Toronto Stock Exchange (TSX) in 2022. The Refinitiv database is primarily employed in our study, based on previous research (Disli et al., 2022). This database is an international platform that gathers and offers environmental, social and governance (ESG) data on over 9,000 firms worldwide. The Refinitiv database ranks 224 TSX firms in our sample for workforce practices, environmental performance, and social performance scores.

Figure 2. Research Model B



Note: Research Model B is a moderated mediation model exhibiting the direct impact of workforce practices, mediating effect of financial performance, and moderating effect of firm age on the social performance of firms.

3.2. Variables and measures

Variables used in the analyses are defined as follows. The *environmental performance* and *social performance* of firms are taken as dependent variables. The data on environmental performance and social performance of firms are gathered from the Refinitiv database. The financial performance of firms, a mediating variable, was measured using return on assets (ROA) and return on equity (ROE). These values were derived from individual firms' annual reports. Workforce practices, including *diversity and opportunity, employment quality, health and safety* requirements, and *training and development*, are used as independent variables. Data on firms' workforce practices are gathered from the Refinitiv database. We used three control variables: *firm age, firm type*, and *industry type*. These three variables suggested in the literature are used because they might affect the relationships between the independent variables and the *environmental* and *social performance* of firms. *Firm age* was added as a moderating variable as the *firm age* might moderate the relationship between workforce practices and the firm's sustainability performance. *Firm type* and *industry type* were used as the other two control variables to establish the robustness of the results.

3.3. Statistical model

We conducted linear regression and moderation-mediation analyses to test the effect of workforce practices on the environmental and social performance of firms.

The moderated mediation model allows the effect of quality of workforce practices (*X*) on the *environmental and social performance* of firms mediated through the *financial performance* of firms (*M*) and moderated by *firm age* (*W*), which can be represented as:

$$Y = i_{vy} + c_1^{1,2,3,4}X + b_1M + W + e_y \quad (1)$$

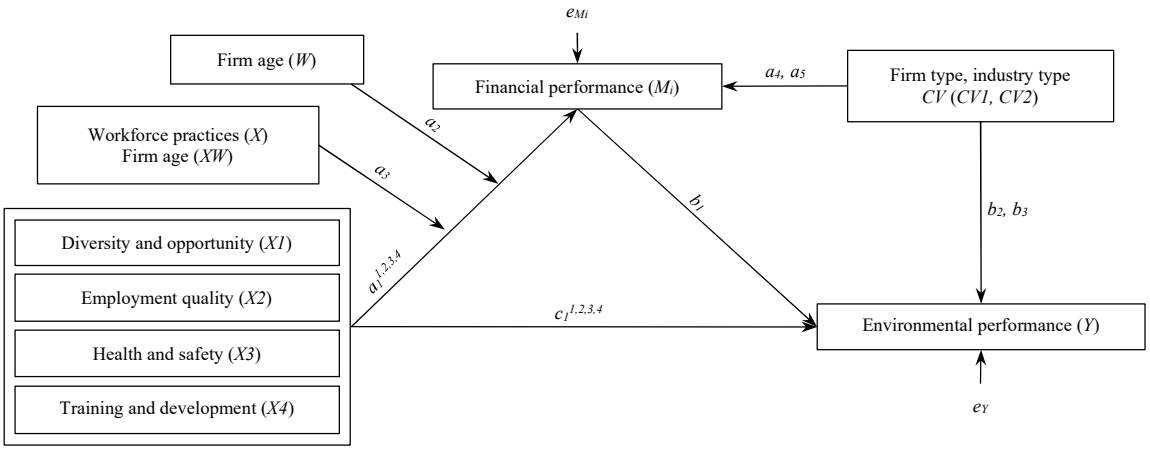
where, the moderated effect (*M*) and the moderated mediated effect (*W*) of *X* on *Y* are expressed as:

$$M = i_{mp} + a_1^{1,2,3,4}X + a_2M + a_3XM + e_{lm} \quad (2)$$

$$W = (a_1^{1,2,3,4} + a_3W)b_1 = a_1^{1,2,3,4}b_1 + a_3Wb_1 \quad (3)$$

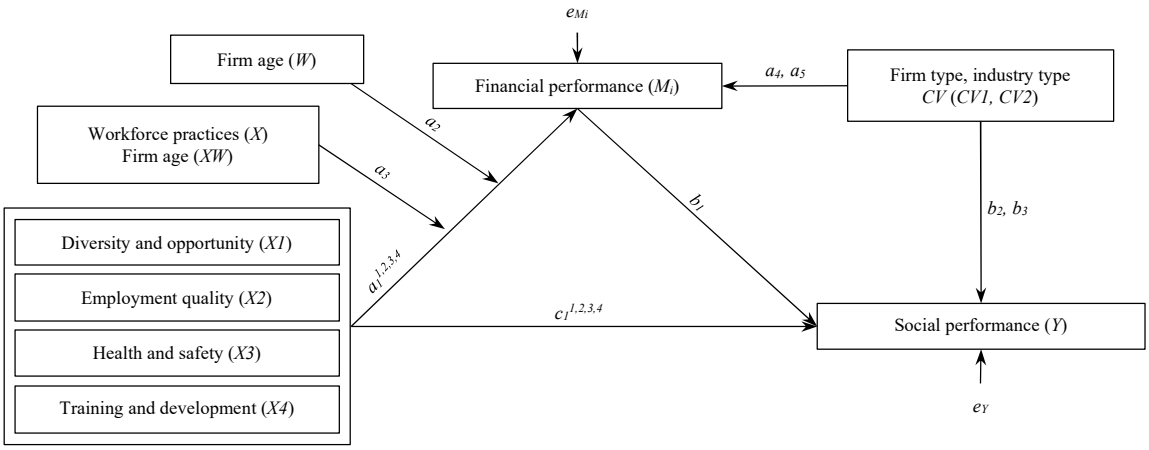
Figures 3 and 4 below explain the moderated mediation model, exhibiting the direct impact of workforce practices, the mediating effect of financial performance, and the moderating effect of firm age on the environmental and social performance of firms.

Figure 3. Statistical Model A



Note: Statistical Model A is a moderated mediation model exhibiting the direct impact of workforce practices, mediating effect of financial performance, and moderating effect of firm age on the environmental performance of firms.

Figure 4. Statistical Model B



Note: Statistical Model B is a moderated mediation model exhibiting the direct impact of workforce practices, mediating effect of financial performance, and moderating effect of firm age on the social performance of firms.

4. RESULTS

4.1. Descriptive statistics

Financial performance (mediating variable) exhibits an average score of 0.489, with a standard deviation of 0.282. The scores range from a minimum of 0.035 to a maximum of 0.967. *Environmental performance* (dependent variable) demonstrates a mean score of 0.395 and a standard deviation of 0.266. The scores range from a low value of 0 to a high value of 0.953. *Social performance* (dependent variable) holds a mean score of 0.492 and a standard deviation of 0.220. The scores range from 0.025 to 0.965. The independent variables, collectively referred to as workforce practices, include *diversity and opportunity*, with a mean of 0.553, and a standard deviation of 0.273; *employment quality* with a mean of 0.556 and a standard deviation of 0.314; *health and safety*, with a mean of 0.593 and a standard deviation of 0.303; and *training and development*, with a mean of 0.516 and a standard deviation of 0.314. The moderator variable *Firm age* displays an average of 44.62 years and a standard deviation of 38.37 years. *Firm age* spans from a minimum of 4 years to a maximum of 214 years. *Firm type*, a control variable, has an average score of 1.64, with a standard deviation of 0.482. *Industry type* is characterized by a mean of 6.91 and a standard deviation of 2.73.

Table 1 shows that financial performance is positively correlated with environmental performance (r = 0.466) and social performance (r = 0.410). *Environmental performance* shows a positive correlation with financial performance (r = 0.466) and social performance (r = 0.778), and social performance is positively correlated with financial performance (r = 0.410). Each of the workforce variables (*diversity and opportunity*, *employment quality*, *health and safety*, and *training and development*) demonstrates positive correlations with both environmental and social performance. Furthermore, *firm age* is positively correlated with environmental performance (r = 0.233), social performance (r = 0.373), and financial performance (r = 0.270).

The correlation analysis reveals important insights into the linear relationships between the independent variables and the dependent variables. *Financial performance* demonstrates a positive linear relationship with both environmental performance and social performance. This suggests that higher financial performance tends to coincide with better environmental and social performance outcomes. All independent variables demonstrate a positive linear correlation between environmental performance and social performance. These correlations highlight that firms with more favorable attributes in terms of organizational diversity, quality of employment, occupational safety and health, and talent development tend to achieve higher environmental and social performance. In addition, all control variables (*firm type, industry type*) display negative linear correlations with environmental performance and social performance. Therefore, these correlations indicate that different types of firms and industries may influence environmental and social performance differently.

Table 1. Descriptive statistics

Variable	*Mean*	*SD*	*Min*	*Max*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Financial performance	0.489	0.282	0.35	0.967	1.000								
Environmental performance	0.395	0.266	0	0.953	0.466**	1.000							
Social performance	0.492	0.220	0.025	0.965	0.410**	0.778**	1.000						
Diversity and opportunity	0.553	0.273	0.020	0.911	0.365**	0.556**	0.509**	1.000					
Employment quality	0.556	0.314	0.027	0.956	0.231**	0.190**	0.110**	0.237**	1.000				
Health and safety	0.593	0.303	0.033	0.959	0.289**	0.522**	0.472**	0.306**	0.215**	1.000			
Training and development	0.516	0.314	0.035	0.886	0.512**	0.718**	0.643**	0.532**	0.230**	0.472**	1.000		
Firm age	44.62	38.37	4	214	0.233**	0.373**	0.270**	0.254**	-0.061	0.117	0.223**	1.000	
Firm type	1.64	0.482	1	2	-0.180**	-0.045	-0.078	-0.037	-0.123	-0.219**	-0.117	0.099	1.000
Industry type	6.91	2.73	1	11	-0.264**	-0.303**	-0.228**	-0.017**	0.070	-0.070	-0.258**	-0.118	0.446**

*Note: ** p < 0.01, * p < 0.05.*

Table 2 shows the frequency distribution of firm type and industry type. In terms of firm type, most firms belong to the "Services" category, accounting for 63.84%, while the remaining 36.16% are categorized as "Manufacturing" firms. This distribution underscores a higher representation of service-oriented firms within the dataset. Meanwhile, the industry type variable reveals a diverse landscape, with various sectors represented. The most prevalent industries include "Technology" at 41.52%, "Mining" at 16.96%, and "Financial services" at 7.14%. The contribution of other industries (from "Oil & gas" to "Transportation") is also presented in Table 2 in descending order of their percentage values. This comprehensive range of industry types reflects diverse coverage across multiple sectors within the dataset. These categorical variables provide context for the composition of the data, and these variables additionally have the potential to serve as important control variables in subsequent analyses, enhancing our understanding of relationships between other variables.

Table 2. Frequency distribution of firm type and industry type

Categorical variables		*Freq.*	*Percent*
Firm type	Services	143	63.84%
	Manufacturing	81	36.16%
Industry type	Technology	93	41.52%
	Mining	38	16.96%
	Financial services	16	7.14%
	Oil & gas	15	6.70%
	Consumer products & services	14	6.25%
	Industrial products & services	12	5.36%
	Utilities & pipelines	11	4.91%
	Communication & media	8	3.57%
	Life sciences	7	3.13%
	Real estate	5	2.23%
	Transportation	5	2.23%

4.2. Results for environmental performance

Table 3 summarizes a detailed study that aims to understand how different factors affect the *environmental performance* of firms. Eight models provide information about direct, mediating, and moderated mediation effects on the *environmental performance* of firms.

Table 3. Linear regression analysis for the environmental performance of firms

Variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Diversity and opportunity	0.502**				0.412**			
Employment quality		0.200**				0.119*		
Health and safety			0.483**				0.413**	
Training and development				0.582**				0.532**
Firm type	0.048	0.087*	0.134**	0.063*	0.063	0.094**	0.136**	0.069*
Industry type	-0.025**	-0.038**	-0.36**	-0.17**	-0.020**	-0.028**	-0.029**	-0.016**
Firm age → Financial performance (FP)					0.004**	0.002*	0.005**	0.003**
Financial performance (Mediation)					0.262**	0.367**	0.279**	0.118*
Diversity and opportunity × Firm age → FP					-0.004**			
Employment quality × Firm age → FP						-0.000		
Health and safety × Firm age → FP							-0.006**	
Training and development × Firm age → FP								-0.004*
Index of moderated mediation (index) [LLCI, ULCI]								
Firm age					-0.001 [-0.002, -0.00]	-0.000 [-0.001, 0.00]	-0.002 [-0.003, -0.001]	-0.000 [-0.001, -0.00]
F-statistic	41.04**	13.54**	46.66**	86.47**	39.97**	22.05**	47.29**	67.53
R^2	0.359	0.156	0.389	0.541	0.422	0.287	0.463	0.552

*Note: ** p < 0.01, * p < 0.05. LLCI — lower level of the 95% confidence interval; ULCI — upper level of the 95% confidence interval.*

4.2.1. Direct effect between workforce practices and environmental performance of firms

Starting with Model 1 in Table 3, *diversity and opportunity* make a significant impact on environmental performance. For every step up in *diversity and opportunity*, environmental performance tends to go up by about 0.502, showing a positive connection. Therefore, *H1a* is accepted.

Moving on to Model 2, our attention shifts to employment quality. Here, we see a similar positive trend — higher levels of employment quality match up with better environmental performance. Roughly speaking, each time the value of the *employment quality* variable increases by one-unit, environmental performance goes up by about 0.200. Therefore, *H1b* is accepted.

Progressing to Model 3, we assess the health and safety impact on environmental performance. When health and safety requirements in the workforce go up (increase in the *health and safety* variable by one-unit), environmental performance tends to rise by approximately 0.483. Therefore, *H1c* is accepted.

Finally, Model 4 centers on training and development. This variable also contributes positively to environmental performance. If the value of the *training and development* variable increases by one-unit, environmental performance tends to rise by around 0.582. Therefore, *H1d* is accepted.

4.2.2. Indirect mediating effect of financial performance on the relationship between workforce practices and environmental performance of firms

Model 5 uncovers that *financial performance* acts as a vital mediator, intervening in the impact of diversity and opportunity on environmental performance. The coefficient of 0.2623 underscores the importance of this mediation. Therefore, *H2a* is accepted.

In Model 6, the findings reveal that financial performance mediates the association between employment quality and environmental performance, with a coefficient of 0.3673 indicating its significance. Therefore, *H2b* is accepted.

In Model 7, financial performance once again takes on the role of mediator. It bridges the gap between health and safety and environmental performance, as evidenced by a coefficient of 0.2786. Therefore, *H2c* is accepted.

In the context of Model 8, the mediating role of financial performance remains consistent, conveying the influence of training and development on environmental performance with a coefficient of 0.1179. Therefore, *H2d* is accepted.

4.2.3. Moderated mediation effect of firm age on the environmental performance of firms

In Model 5 in Table 3, the index of moderated mediation emphasizes the role of firm age. With a value of -0.001 and a confidence interval of [-0.002, -0.00], firm age significantly influences the mediation process. This indicates that younger firms might play a more pronounced role in channeling the effects of diversity and opportunity to environmental performance through financial performance. This nuanced insight illuminates how various firm ages contribute uniquely to these complex relationships. Therefore, *H3a* is accepted.

In Model 6 in Table 3, the index of moderated mediation does not suggest a substantial influence of firm age (with a value of -0.0001 (rounded to -0.000) and a confidence interval of [-0.0012, 0.0008]), which aligns with the finding that firm age does not notably impact the mediation process. This insight demonstrates how financial performance mediates between employment quality and environmental performance, without any significant firm age moderation effect. Therefore, *H3b* is rejected.

In Model 7 in Table 3, the index of moderated mediation unveils that firm age significantly alters the mediation process, with a value of -0.0018 (rounded to -0.002) and a confidence interval of [-0.0029, -0.0009] (rounded to [-0.003, -0.001]). This indicates that younger firms potentially play a more pronounced role in influencing the mediation process between health and safety and environmental performance through financial performance. Therefore, *H3c* is accepted.

The index of moderated mediation provides nuanced insights, indicating that firm age subtly influences the mediation process between training and development and environmental performance through financial performance. This effect is captured by the index value of -0.0004 (rounded to -0.000), supported by a confidence interval of [-0.0010, -0.0000]. Therefore, *H3d* is accepted.

4.3. Results for social performance

Table 4 summarizes a detailed study that aims to understand how different factors affect firms' social performance. Eight models provide information about direct, mediating, and moderated mediation effects on the social performance of firms.

4.3.1. Direct effect between workforce practices and social performance of firms

Model 1 underscores the importance of diversity and opportunity, indicating that enhancing these aspects by one unit could lead to a 0.389 increase in social performance. Therefore, *H4a* is accepted.

Model 2 reveals a positive connection between social performance and employment quality, implying that a one-unit improvement in employment quality is associated with a 0.159 rise in social performance. Therefore, *H4b* is accepted.

In Model 3, the relationship between social performance and health and safety is significant, highlighting that augmenting health and safety by one unit could result in a 0.352 increase in social performance. Therefore, *H4c* is accepted.

Model 4 explores the link between social performance and training and development, revealing that a one-unit improvement in training and development corresponds to a 0.439 increase in social performance. Therefore, *H4d* is accepted.

Table 4. Linear regression analysis for the environmental performance of firms

Variable	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*	*Model 7*	*Model 8*
Diversity and opportunity	0.389**				0.325**			
Employment quality		0.159**				0.100*		
Health and safety			0.352**				0.301**	
Training and development				0.439**				0.404**
Firm type	0.002	0.033	0.066*	0.014	0.013	0.038	0.067*	0.018
Industry type	-0.012*	-0.022**	-0.021**	-0.006**	-0.009	-0.012**	-0.016**	-0.006
Firm age → Financial performance (FP)					0.004**	0.002*	0.005**	0.003**
Financial performance (Mediation)					0.186**	0.267**	0.207**	0.081
Diversity and opportunity x Firm age → FP					-0.004**			
Employment quality × Firm age → FP						-0.000		
Health and safety × Firm age → FP							-0.006**	
Training and development × Firm age → FP								-0.004
Index of moderated mediation (Index) [LLCI, ULCI]								
Firm age					-0.001 [-0.002, -0.00]	-0.000 [-0.000, 0.00]	-0.001 [-0.002, -0.001]	-0.000 [-0.001, -0.00]
F-statistic	28.36**	8.41**	28.05**	52.71**	26.42**	14.09**	27.81**	40.60**
R^2	0.279	0103	0.277	0.418	0.326	0.205	0.337	0.426

*Note: ** p < 0.01, * p < 0.05. LLCI — lower level of the 95% confidence interval; ULCI — upper level of the 95% confidence interval.*

4.3.2. Indirect mediating effect of financial performance on the relationship between workforce practices and social performance of firms

In Model 5, the results show that *financial performance* acts as a vital mediator, intervening in the impact of diversity and opportunity on environmental performance. The coefficient of 0.186 underscores the importance of this mediation. Therefore, *H5a* is accepted.

In Model 6, the findings reveal that financial performance mediates the association between employment quality and environmental performance, with a coefficient of 0.267 indicating its significance. Therefore, *H5b* is accepted.

In Model 7, financial performance once again takes on the role of mediator. It bridges the gap between health and safety and environmental performance, as evidenced by a coefficient of 0.207. Therefore, *H5c* is accepted.

In Model 8, the mediating role of financial performance remains consistent, conveying the influence of training and development on environmental performance with a coefficient of 0.081. Therefore, *H5d* is accepted.

4.3.3. Moderated mediation effect of firm age on the social performance of firms

In Model 5 in Table 4, the index of moderated mediation unveils that firm age significantly alters the mediation process between diversity and opportunity and social performance, with a value of -0.001 and a confidence interval of [-0.002, -0.00]. Therefore, *H6a* is accepted.

In Model 6, the index of moderated mediation unveils that firm age significantly does not alter the mediation process between employment quality and social performance, with a value of -0.000 and a confidence interval of [-0.000, 0.00]. Therefore, *H6b* is rejected.

In Model 7, the index of moderated mediation unveils that firm age significantly alters the mediation process between health and safety and social performance, with a value of -0.001 and a confidence interval of [-0.002, -0.001]. Therefore, *H6c* is accepted.

In Model 8, the index of moderated mediation unveils that firm age significantly alters the mediation process between training and development and social performance, with a value of -0.000 and a confidence interval of [-0.001, -0.00]. Therefore, *H6d* is accepted.

5. DISCUSSION

The inferential statistical analysis discussed in the previous section examined whether each workforce practice was effective for achieving environmental and social performances from the perspective of Canadian firms listed in the TSX. The goal of the present study was to assess the influence of workforce practices on the environmental and social performance of firms and to validate the identified practices on a sample of Canadian firms. The Refinitiv database was used to achieve the goals of the study, examining four workforce practices as highly influential in firms' sustainability performance. This section provides an attribute-level discussion of these workforce practices and highlights significant findings from the statistical analyses previously presented.

5.1. Diversity and opportunity

A deep examination of the inferences of diversity and opportunity on the environmental and social performance of firms has led to firms' commitment to operating ethically and responsibly. Diversity practices encompass a broad range of topics, such as environmental sustainability, social responsibility, community engagement, and ethical business practices. Previous studies have shown that diversity can improve sustainability performance by adapting best practices regarding inclusion and enhancing firms' compliance with global trends and sustainability standards (Armstrong et al., 2010; Beji et al., 2021; Ghaleb et al., 2021; Hansen & Seierstad, 2017). The findings in this paper also suggest that diversity practices can be seen as a component of a firm's sustainability initiatives. The results show that most firms from the data sample considered implementing diversity and inclusion practices, which is consistent with the previous literature, as a firm's environmental and social performance can be enhanced by valuing and leveraging the diversity of its workforce. Additionally, the results of this paper are consistent with the previous literature suggesting that firms can improve their understanding of and service for their diverse customer base through diversity practices, which can also contribute to their sustainability (Alodat et al., 2023).

The relationship between diversity practices and firm sustainability can be explained using various theories. Most studies that investigate the connection between diversity practices and sustainability performance are limited to examining only specific diversity aspects. According to signaling theory, signaling diversity and opportunity can lead to firms incorporating different perspectives (Ruhnke & Gabriel, 2013), and the inclusion of a wide range of views, opinions, and concerns in any sustainability discussion can enhance a firm's sustainability performance.

5.2. Employment quality

In this paper, the relationship between employment quality and sustainability performance is examined. Whereas previous research has mostly relied on one-dimensional approaches to study this relationship (Sadri & Goveas, 2013), some papers have utilized multiple employment arrangements, which include indicators such as job dissatisfaction (Pang et al., 2023), perception of a negative safety climate (Jain et al., 2018), and inability to stay in employment (Lee & Chen, 2018). Therefore, attention has been given to the distinct and combined relationships between these outcomes and employment quality. Many of these studies focus on only one factor of employment quality; however, the literature on employment quality indicates that employment quality factors occur concurrently in definite configurations and are clustered in specific groups of workers. This paper utilizes an approach that simultaneously considers numerous aspects of employment quality to avoid the possibility of giving only a partial picture of the impact of a specific employment arrangement.

In recent decades, Canada's employment quality has been influenced by more flexibility and de-standardization in various aspects of employment conditions and relationships (Organisation for Economic Co-Operation and Development [OECD], 2014). The consequences of these changes are still unclear, but an important topic discussed in this paper is the balance between work quality and sustainability performance in contemporary labor markets. Not only do this paper's findings indicate that quality of employment is aligned with corporate sustainability objectives, but its results are in line with previous research in this field showing the importance of employment quality in firms' achievement of environmental and social performance (Gallie, 2007; Savitz et al., 2013; Wiengarten et al., 2017). Such a study of the relationship between employment quality and sustainability performance highlights an important fact: workers from the precarious, unsustainable cluster face a problematic situation (Lewchuk et al., 2011) in that precarious jobs cause workers to struggle with environmental and social performance. This paper's results agree with such findings, which suggest that a firm's sustainability performance is often influenced by the combination of favorable employment quality and sustainability initiatives. Thus, in most instances, the relationship between employment quality and sustainability outcomes remains dependent after considering intrinsic work quality.

5.3. Health and safety requirements

The challenges of sustainable development goals are related to the workforce's health and safety requirements. Both the environment and citizenry would face danger without healthy workers and safe working places. Unhealthy workers in unsafe conditions cannot maximize efficiency, which would lead to difficult economic conditions for firms and, in turn, impact society and the environment. Along with improving work-life balance, the workforce's health and safety requirements benefit both environmental and social performance (Ali et al., 2021; Johanson et al., 2022). For example, green space coverage at the workplace, as a health indicator, plays a positive role in health-related aspects of sustainability (Kim et al., 2021).

The importance of demonstrating and justifying the value of health and safety requirements for sustainability is growing. Despite multiple studies showing the positive environmental and social performance of firms that meet their health and safety requirements (Johanson et al., 2022; Vujica-Herzog & Harih, 2020), these estimates are not always straightforward. It can be challenging to determine the accurate costs and benefits of occupational health and safety, as costs are instantaneous while benefits generally accrue over time. Additionally, it can be challenging to quantify the benefits in monetary terms, such as measuring employees' motivation to incorporate safety and environmental stewardship into their daily work routine (de Oliveira Sousa et al., 2021). Despite these challenges, the findings of this paper are consistent with the previous literature, suggesting that firms must significantly improve occupational health and safety both for their survival and for environmental and social protection.

5.4. Training and development

Previous studies have suggested that training and development are significant factors in building organizational capabilities and skill enhancement. Scheel et al. (2014) asserted that talent development is essential for ecologically acceptable and socially sustainable economies. The development of organizational learning systems is crucial for firms' successful social and environmental performance. Such talent development has the potential to promote sustainability management, encourage employees to engage in green activities and create a pro-environmental culture (Birou et al., 2019; Bluff, 2019). Furthermore, intangible social and environmental knowledge-based processes can be aligned with a firm's strategic objectives. This paper, in accordance with previous research, evaluated sustainability performance after training and found that sustainability and training are positively related.

This paper not only provides new insights into the importance of training and development but also provides empirical findings supporting the positive impact of talent development on sustainability performance, including the environmental and social performance of firms. Signaling theory plays a key role. This paper demonstrates that firms can provide personalized training, coaching, and advisory solutions based on signaling theory and its successful application. Furthermore, the results of our paper agree with the concept of producing tangible environmental and socially driven results and establishing sustainable businesses.

6. CONCLUSION

In accordance with previous theory, our research indicates that a firm's workforce practices have a positive impact on its social and environmental performance. Additionally, the financial performance of firms has a positive correlation with workforce practices and sustainability performance. These results support the findings of Ameer and Othman (2012), Reverte et al. (2016), and Visvizi (2022). The inclusion of organizational diversity, quality of employment, occupational safety and health, and talent development into the model, and creating a reliable and valid scale for measuring social and environmental performance, extends the work done by Alodat et al. (2023), Johanson et al. (2022), Sadri and Goveas (2013) and Scheel et al. (2014). The purpose of this article was to expand the discussion on the concept of the workforce, expressed through the implementation of effective labor practices to ensure sustainability; and to emphasize the importance of improving the workforce value proposition for the social and environmental performance of firms. Thus, the results of the present study show that "workforce practice" is an important element of a firm's sustainability performance.

This study has investigated variables consistent with a firm's sustainability performance. The social and environmental performance of firms is dependent on organizational workforce practices, which are mediated by the financial performance of firms. The findings of this paper also suggest that firm age significantly alters the mediation process. However, when interpreting the results of this

research, it is important to consider several limitations. First, the cross-sectional nature of the data prevents firms from reporting on correlation with financial performance. Specifically, the cross-sectional variation in response rates is an issue when it comes to workforce practices. However, the Refinitiv database's unique measurement of workforce practices makes it the most suitable data source, in our opinion. Second, our research is limited by missing data in the Refinitiv database and the variable degree of relevance of the data. We aim to address the structural effects of each dimension of workforce practices, along with other dimensions of social and environmental performance of firms, separately, in future research. Furthermore, the study predicts that the selected firms see publishing data on workforce practices, as a signaling tool or as part of corporate sustainability activities, as an advantage. However, such published workforce practices are not necessarily indicative of the implementation and development of such practices. Furthermore, firms may choose not to disclose these workforce practices publicly in certain contexts where they are not widely adopted.

Overall, our results provide support for firms in a few regards. Firms embarking on sustainable plans should be motivated by our results to seek better workforce practices to support sustainability performance and should have some confidence in obtaining positive outcomes. Additionally, firms can use these workforce practices in conjunction with their financial performance to measure and monitor their sustainable practices and outcomes. Finally, firms will be able to find additional economic justification for their increased workforce practices and sustainability orientations if further data match the expectations created by this research.

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