

ESG and Firm's Risk-Taking: International Study

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Abstract

This study provides international evidence for the impact of environmental, social, and governance (ESG) on firm's risk-taking based on 7451 publicly listed firms across 141 different industries and 74 countries over 1999-2019. We hand collect ESG score, stock price, and other corporate financial data for all publicly listed firms available on the Thomson Reuter Eikon ESG database. Using the Panel data model with FGLS (Feasible Generalized Least Squares) approach, we find that firms with better aggregated ESG performance significantly mitigate the firm's risk-taking. Our findings are much robust to the results from different measures of environmental performance, social performance, and governance performance. However, firm's characteristics are previously shown to be associated with lowering risk-taking behavior. We believe that the top management of all corporations in all industries sectors in the world is risk-loath, in general, and that ESG participation aids their risk management efforts. Our empirical findings back up our assertions that the influence of ESG on corporate risk-taking is a critical mechanism via which environmental, social, and governance impact firm value.

Keywords: Environmental, Social, and Governance (ESG); Corporate Social Responsibility; Firm value; Firm risk; Risk-taking; International Study

1. Introduction

Sustainable investing has grown in popularity over the years, it became familiar with terms like corporate social responsibility (CSR), environmental, social, and governance (ESG), or ethical investment being used all over the world. Proponents of sustainable investment that tries to evaluate both corporate financial profit and social-environmental good in order to bring about positive change. Environmental, social, and governance are distinct from the fundamental principle of good citizens in that it encourages firms to go above and beyond their legal responsibilities to help in improving everybody's living standards (include their families and employees), in relation to the national community and society overall. The United Nations' Chief Economist, Elliott Harris, spoke about the importance of environmental and social issues in a recent interview, ESG-based investing was once a small specialty practiced by a few specialized firms off Wall Street. ESG is becoming more important to investors and financial institutions, and it has become a fundamental aspect of company operations (Harris, 2021). Cellier and Chollet (2016) show that the publication of ratings creates a big positive reaction in the stock market, irrespective of whether the rating is unfavorable or good. This finding emphasizes the importance of engaging in corporate social activities and demonstrates the value of corporate responsibility. In the present, we study whether ESG is weaken firm risk-taking. Previous studies have documented a number of control mechanisms with firm risk-taking such as management compensation schemes(Wang 2012), investor protection(John et al., 2008), diversified shareholders(Faccio et al., 2011), and capital regulation(Furlong & Keeley, 1989). When a firm wants to earn a higher profit they are willing to pay high-cost and willing to take more risk. ESG practices emerge as a control mechanism for risk-taking and improving firm value, it's suggested for managers' decisions by using environmental-social responsibility to design the overall strategy for their firms (Harjoto & Laksmana, 2018). Specifically, they show that corporate social responsibility has a positive indirect influence on corporate value by influencing risk-taking. They argue that sustainable investment supports companies in reducing extreme risk-taking and reduce excessive risk avoidance, at the same time helping firms balance the profit of numerous stakeholders. Mulia and Joni (2019) examine into the impact of corporate social responsibility and risk-taking in Indonesia and show that corporate social responsibility has an impact on both operational and market risks. The results suggest that corporate social responsibility practice is an effective vehicle to reduce corporate's risks in the emerging market context. Even in the controversial industry sectors, Jo and Na (2012) find that risk reduction through corporate social responsibility engagement is statistically significant, that help the managers manage risk. A study examining 1201 US-listed firms document the higher corporate social responsibility have lower financial distress risk, that increases the creditworthiness of companies and easier access to finance, which is rewarded with fewer financial misconduct (Boubaker et al., 2020). All documents and evidence are introduced that suggest a firm can reduce their risk through effective ESG practice.

However, the empirical results of sustainable issues are still mixed and continued debate in the middle of academic researchers and practical. On the one hand, corporate social responsibility activity strengthens a company's relationship with important stakeholder groups and improves its public image (Harjoto & Laksmana, 2018). Having a good reputation also increases the creditworthiness and easier access to finance, which is rewarded with less financial misconduct, leading to reduce firm risk(Boubaker et al., 2020). On another hand, previous

studies argue the environmental component is a significant investment in manufacturing processes in order to reduce pollution and protect the environment. If this significant investment can not carry on the sell product prices that lead to a negative effect on the corporate financial performance (Klassen & Whybark, 1999). Furthermore, the environmental management activities need a long time to come visible results, these may put corporate in the state of being uncertain and may not always bring competitive benefits to businesses (Aragón-Correa & Sharma, 2003). Based on the above empirical studies discussed, there are still mixed and lack a holistic view. Our research provided international evidence and fills in the missing gap which has a different character compared to the evidence from other studies. In the next part, we presents the literature and research hypotheses. The data and sample selection procedure are described in section 3. In section 4, we describe the methodology we tested our hypothesis. Empirical findings are presented and discussed in section 5. Finally, in section 6, the study concluded and makes recommendations for future research.

2. Literature Review and Hypothesis Development

ESG effectiveness could affect different aspects of the company. And there are three main reasons that can explain the point why ESG should affect corporate risk-taking:

First, corporate environmental-social responsibility activities that satisfy stakeholder expectations (in particular: employees, customers, communities, and the environment) represent important intangibles for shareholder value creation and minimize firm risk (Godfrey, 2005; Jiao, 2010; Kim et al., 2019). When a firm engages in sustainable activities that meant they send a positive message to stakeholders, showing that businesses are committed to creating long-term value. By examining the company's commitment message, stakeholders can assess and work with a long-term perspective. Stakeholder power can influence the success or failure of any project, and firms can suffer financial losses and brand damage if management's objectives are not aligned with those of stakeholders (Harjoto & Laksmana, 2018). In contrast, when firms care for the stakeholders and find a way that can satisfy them, they are more likely to understand stakeholders' needs as well; this is beneficial to managers to avoid bad news, restrict risk, or lack of information and in the backmost is create value for shareholders. Corporate social responsibility related activities may be used as a control tool to balance the interests of both shareholders and stakeholders (Mason & Simmons, 2014) and advise firms on how to allocate their resources to meet the needs of their stakeholders. More efficient resource allocation to such regions or plans will prevent excessive risk-taking, allowing the organization to maintain its optimal risk-taking level (Harjoto & Laksmana, 2018). Luo and Bhattacharya (2009) study the impact of corporate social performance on systematic risk also showing that corporate social performance plays the role of providing "insurance-like" protection firm and tends to lower systematic risk. Corporate environment-social responsibility has a considerable impact on default risk reduction, according to (Sun & Cui, 2014), and this association is stronger for companies in high dynamism environments than in low dynamism contexts. In the controversial industry sectors where the firm is more of an issue, Jo and Na (2012) show corporate social responsibility engagement is statistically significant in reducing firm risk.

Second, when future restrictive environmental rules are anticipated, adopting ESG policy help companies avoid the risk of new regulations and play an insurance substitute role (Becchetti et al., 2015). In the long-term orientation, corporate environment-social responsibility practice

has a better opportunity to build a favorable reputation, and that has an important “insurance-like” protect companies from negative communities or stakeholder assessment (Godfrey, 2005; Jia et al., 2020). In addition, the cost of corporate social responsibility activities is very similar to paying insurance premiums (Minor & Morgan, 2011). All the above-mentioned factors will help the firm become more resilient and that is necessary during the crisis time. Recently, the global effect of the Covid-19 pandemic has had an impact on corporations and investors. Díaz et al. (2021) examine the effect of corporate social responsibility on the different industry during the Covid-19 crisis and shows corporate social responsibility practice significantly explain industry returns. Therefore, the higher the ESG engagement, the lower the perceived firm’s risk.

Third, ESG can improve the firm’s financial conditions, credit ratings, and lower capital constraints, leading to lower risk-taking. Recently, a research evidence compilation from over 1,000 published research during the period 2015-2020 indicated a positive link between the environment-social quality and efficiencies in operations, stock performance, and leading lower capital costs. Especially, there are up to 58% of the “corporate” studies have a positive relationship between financial performance and environment-social performance (Whelan et al., 2021). If ESG activities benefit the company's finances and companies have a high environment-social rating score, credit rating agencies might value the company's credit in a good rating (Jiraporn et al., 2014). Credit agencies are financial institutions with a deep understanding of the financial markets, and they also have better access to information. As a result, if ESG strategy has a positive impact, credit rating agencies are more easily to value it than general investors. In fact, the big three credit rating agencies in the world have launched credit rating-related environment-social having Fitch Ratings, along with S&P Global Ratings, and Moody's Investors Service. Moody's, in special, introduced a tool in July 2021 that generates forecasted environmental, social, and governance in real-time for millions and millions of small and midsize enterprises, both public and private around the world (Moody's, 2021). The importance of socio-environmental factors to a company's credit rating has been demonstrated by efforts to include them in the credit rating processes of these major credit institutions. In addition, integrating sustainability criteria into evaluation has significantly improved the quality of credit risk assessment, estimating a debtor's financial performance, and helped to reduce the “non-performing loans” ratio (Weber et al., 2010). As part of its financial performance, a company's creditworthiness is influenced by its sustainability. Higher credit rating firms make agencies will start noticing that companies adhere to high ethical standards, thus these companies are less monitored. Less monitoring by communities and agencies will reduce the company's cost of capital and ultimately increase the firm's value (Lopatta, Buchholz et al. 2016). With the goal that increasing trust and enhancing stakeholder engagement, (Choi and Wang 2009) believe the negative relationship between ESG and capital constraints is improvement stakeholder relation. We propose the following hypotheses based on the previous theoretical framework and the empirical research:

Hypothesis 1: ESG performance is weakens risk-taking.

Hypothesis 2: Individual components of environmental performance, social performance, and governance performance are significantly associated with lowering risk-taking.

3. Data and sample selection

Regarding data collection, we use data from the Thomson Reuters database to construct the independent variables of the empirical model, specifically the Environment, Social, and Governance of the company. The ESG Scores were created to measure a company's relative ESG performance across ten themes (emissions, environmental product innovation, human rights and so on) based on company reported data. With a history that began in 2002, Thomson Reuters has one of the most comprehensive ESG databases in the industry, covering over 6,000 public companies and more than 400 metrics. This is one of the largest ESG content collection operations in the world, it is very popular database used in many studies (Boubaker et al., 2020; Bouslah et al., 2013; Harjoto & Laksmana, 2018). The financial data and stock price is also collected in the Thomson Reuter data stream corresponding to which firms have ESG data. For the selection of firms, we only looked at companies that were listed and available ESG data in the Thomson Reuters Eikon database. The final sample was composed of observations from 7451 companies during the 1999-2019 period, across 141 different industries and 74 countries.

4. Methodology

4.1. Measuring ESG

To measure ESG, we use a score directly and all qualitative dimensions of the Thomson Reuter ESG Eikon database. All companies are required to have comprehensive information for all variables. We employ a panel dataset containing environmental, social, and governance performance scores collected from Thomson Reuters Eikon database for our empirical research and to quantify ESG performance. Based on the data points, Thomson Reuters Eikon database provides a platform for evaluate companies. Data points are put into a default equal-weighted framework, which generates 250 key performance indicators (KPIs), which are then classified into 18 categories under 3 pillars: Environmental performance score, Social performance score, and Governance score. A firm receives a z-score for each of the pillars in year t , evaluating its effectiveness against the remainder of the companies based on all of the available information in fiscal $t-1$ (Ioannou & Serafeim, 2010). Having followed this filter, the final sample was an unbalanced panel, composed of observations from 7451 companies across 141 different industries and 74 countries.

4.2. Measuring Risk-taking

To proxy for corporate risk taking, we use 4 variables. The first is standard deviation of daily stock returns (SDEV) for the fiscal year. The (SDEV) is the market risk measure and represents the measure of equity risk as reflected in stock return volatility. The next three measures : The (SDROA) is defined as country-adjusted standard deviation of return on assets, where ROA is calculated as earnings before interest and taxes divided by assets. This variable evaluate management's risk-taking decisions for the company. As another measure of operational risk, we estimate the standard deviation of return on equity (SDROE) using annual data and a 5-year overlapping window. The (Max (ROA)–Min (ROA)) is the difference between maximum and minimum values of return on assets over a 5-year period. Our risk-taking measures are similar to those used in previous studies (Boubakri et al., 2013; Harjoto & Laksmana, 2018; Mohsni et al., 2021; Tran, 2019).

4.3. Empirical Models

We use the following empirical formulation to investigate the impact of ESG on firm risk-taking. We regress firm-level measures of risk-taking on variables that capture firm characteristics, country-level macroeconomic variables, and economic development variables. The following is our model specification:

$$Risk_{i,j,t} = \alpha_0 + \beta_1 \times ESG_{i,j,t} + \sum_k \delta_k \times FirmControl_{i,j,t} + \sum_p \theta_p \times CountryControl_{j,t} + \psi_i + \nu_t + \zeta_{i,j} \quad (1)$$

$$Risk_{i,j,t} = \alpha_0 + \beta_2 \times ENV_{i,j,t} + \sum_k \delta_k \times FirmControl_{i,j,t} + \sum_p \theta_p \times CountryControl_{j,t} + \psi_i + \nu_t + \zeta_{i,j} \quad (2)$$

$$Risk_{i,j,t} = \alpha_0 + \beta_3 \times SOC_{i,j,t} + \sum_k \delta_k \times FirmControl_{i,j,t} + \sum_p \theta_p \times CountryControl_{j,t} + \psi_i + \nu_t + \zeta_{i,j} \quad (3)$$

$$Risk_{i,j,t} = \alpha_0 + \beta_4 \times GOV_{i,j,t} + \sum_k \delta_k \times FirmControl_{i,j,t} + \sum_p \theta_p \times CountryControl_{j,t} + \psi_i + \nu_t + \zeta_{i,j} \quad (4)$$

Where for Firm i , Country j , and Year t . *Risk* is proxy for *Risk-taking* that is either the standard deviation of daily stock returns (SDEV) for the fiscal year, the standard deviation of for the year return on assets (SDROA) or the standard deviation of annual return on equity (SDROE). ESG is a measure of a company's social responsibility performance. Following on previous research (Bouslah et al., 2013; Mulia & Joni, 2019; Tran, 2019), we set up the control variables that affect *Risk* is included: *FirmControl* and *CountryControl*. First of all, *FirmControl* means a set of control variables at the firm level: Companies size (SIZE) directly reflects its high level of operational activity and it is calculated as the natural logarithm of total assets. We expect the SIZE variable to be negatively related to risk-taking. The growth rate of sales (GRS) is the annual growth rate of sales; it captures the effects of firm-specific growth prospects on corporate risk-taking and is believed to be positively associated with risk-taking (Boubakri et al., 2013). Companies LEVERAGE is a proxy for companies financial situation, which is defined as the ratio of total debt to total assets. This proxy is found positively related to corporate risk-taking (Boubakri et al., 2013). LIQUIDITY by the quick ratio, computed as the current assets scaled by current liabilities. This variable is included due to its indirect effects on insider ownership. FIRM AGE is a logarithm of one plus the firm age from the establishment of the firm to the year of observation to capture the lifecycle of a firm. Because younger companies are found to be more risk-taking than older companies (Boubakri et al., 2013). Tobin's Q is a method of evaluating whether a certain firm or market is overpriced or undervalued by dividing the market value of a company by the replacement cost of its assets. DIVIDEND refers dividend yield to the previous 12-month dividends divided by quarter-end price (Nofsinger et al., 2019). For *CountryControls* we control the gross domestic product (GDP) is the sum of the value-added across all the firms in the economy, looking at growth in GDP is a natural way to measure the level of productivity of a country.

5. Empirical results

Table 1 shows the summary statistics, the mean SDEV is 2.570 with a standard deviation of 1.889. The independent variable ESG has a mean of 39.679 and standard deviation of 19.326. Other summary statistics of the firm and control variables are shown, and all variables are consistent with previous research findings (Boubakri et al., 2013; Mulia & Joni, 2019; Tran, 2019).

Table 1: *Descriptive statistics*

Variables	Observations	Mean	SD	p10	p25	p50	p75	p90
SDEV	53788	2.57024	1.889183	1.287115	1.639485	2.180326	2.994502	4.129018
SDROA	77162	6.41972	8.536795	0.9581231	1.789693	3.538502	7.353911	14.62799
SDROE	55944	18.40264	153.1344	2.306079	4.133764	8.135908	16.05514	31.03783
Max-Min(ROA)	77162	15.21052	20.00331	2.3	4.3	8.5	17.5	34.8
ESG	33502	39.67912	19.32685	15.3	24.14	38.05	53.96	66.91
ENVIRONMENT	32333	33.68342	29.31915	0	3.62	29.36	58.82	77.03
SOCIAL	33496	40.6778	23.39037	11.46	21.97	37.62	57.705	75.1
GOVERNANCE	33502	48.22429	22.66713	17.55	30	48.4	66.46	78.89
ROA	74549	5.13098	18.8166	-6.6	2.1	6.4	12.1	19.6
ROE	73030	12.47493	294.7385	-13.7	5.6	15.4	26.8	42.2
FIRM AGE	77162	0.7392116	0.6685443	0.1349967	0.3157342	0.6331378	0.9257234	1.37868
TobinQ	69789	40.29134	301.6577	0.3447625	0.6440473	1.493137	5.69569	39.60558
DIVIDEND	65120	13.14879	576.3279	0	0	1.496987	3.166932	5.292279
LIQUIDITY	77162	0.7518011	0.5965649	0.2306852	0.4	0.6298447	0.9104594	1.320675
LT_DEBT	77161	0.1740295	0.1984383	0	0.0096095	0.1336662	0.2672897	0.4059202
GRS	69214	0.7228489	56.56929	-0.149046	-0.0183357	0.0868048	0.2344462	0.5031425
LEVERAGE	74541	17.76728	3384.644	1.25	1.56	2.13	3.08	4.78
SIZE	77162	0.7358938	2.398492	0.00956	0.03523	0.1391	0.5002	1.5999
GDP	74879	2.888104	5.656953	-2.84718	0.2345342	2.736271	5.849071	8.243926

(This table presents the descriptive statistics of the sample. N, SD, p10, p25, p50, p75 and p90 denote the sample observations, standard deviation, 10th percentile, 25th percentile, and 50th percentile, 75th percentile respectively)

Table 2 presents the regression result for the relationship between ESG and SDEV - our measure of market risk-taking. Model 1 shows aggregate ESG score is negative and significantly associated with risk-taking at the 1% level (coefficient = -0.344; t = -5.488). Therefore, we accepted the hypothesis 1 which states that “ESG performance is weakens risk-taking”. After we include a set of both country and firm characteristics control variables, such as TobinQ, LT_DEBT, DIVIDEND, the firm SIZE, and the growth of GDP the result remaining significant. The results are consistent with previous research (Harjoto and Laksmana 2018; Jo and Na 2012; Mulia and Joni 2019). In addition, the individual ESG component (environmental, social, and governance) also shows the same negative and significance related to risk-taking at the 1% level. The Hypothesis 2 is accepted.

Table 2. *ESG and Risk-taking Regression (Standard deviation of daily stock returns(SDEV) proxy for Risk-taking)*

Independent Variables	Dependent Variables= Standard deviation of daily stock returns (SDEV)			
	Model [1]	Model [2]	Model [3]	Model [4]
ESG	-0.344***			
	(-5.488)			
ENVIRONMENT		-0.123***		
		(-3.043)		
SOCIAL			-0.248***	
			(-4.834)	
GOVERNANCE				-0.171***
				(-3.003)

Independent Variables	Dependent Variables= Standard deviation of daily stock returns (SDEV)			
	Model [1]	Model [2]	Model [3]	Model [4]
ROE	0.306*** (5.879)	0.287*** (5.502)	0.310*** (5.963)	0.298*** (5.744)
FIRM AGE	1.077 (0.602)	2.272 (1.250)	1.134 (0.633)	1.274 (0.710)
TobinQ	-2.832*** (-4.059)	-2.645*** (-3.701)	-3.123*** (-4.511)	-2.832*** (-4.059)
DIVIDEND	-0.011*** (-6.785)	-0.011*** (-6.636)	-0.011*** (-6.757)	-0.011*** (-7.026)
LIQUIDITY	1.572 (0.749)	2.101 (0.977)	1.463 (0.698)	1.485 (0.708)
LT_DEBT	-16.978* (-1.909)	-15.040* (-1.711)	-17.261* (-1.945)	-19.634** (-2.207)
GRS	-0.012 (-1.092)	-0.014 (-1.296)	-0.012 (-1.118)	-0.012 (-1.170)
LEVERAGE	-0.220 (-1.024)	-0.179 (-0.865)	-0.233 (-1.045)	-0.231 (-1.080)
SIZE	-0.400 (-1.589)	-0.371 (-1.378)	-0.331 (-1.278)	-0.537** (-2.069)
GDP	-4.343*** (-14.199)	-4.722*** (-15.342)	-4.323*** (-14.123)	-4.272*** (-14.002)
CONSTANT	268.266*** (66.722)	257.237*** (79.043)	264.838*** (70.309)	263.416*** (65.262)
Observations	19,457	18,484	19,457	19,457
Adjusted R ²	0.015	0.018	0.015	0.014
F-statistic	29.660***	30.336***	27.829***	28.062***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

(The table reports with symbols *, **, and *** indicate significance levels at 10%, 5% and 1% respectively)

The regression result for the relationship between ESG and SDROA- our measures of operational risk is shown in Table 3. In the table, at the 1% level, aggregate ESG performance is negatively related to operational risk-taking (coefficient =-0.033; t =-17.311). Corporate social responsibility's key goal is to increase the company's good effect while minimizing the company's operational risk (SDROA). Furthermore, ESG assists businesses in reducing inefficiencies in manufacturing, which reduces operational costs and hazards. As a result, environmental, social, and governance may be utilized to reduce operational risk (SDROA). The results are consistent with previous research (Harjoto and Laksmana 2018; Mulia and Joni 2019).

Table 3. *ESG and Risk-taking Regression (SDROA proxy for Risk-taking)*

Independent Variables	Dependent Variables= SDROA			
	Model [1]	Model [2]	Model [3]	Model [4]
ESG	-0.033*** (-17.311)			
ENVIRONMENT		-0.025*** (-19.725)		
SOCIAL			-0.022*** (-13.953)	
GOVERNANCE				-0.009*** (-5.449)
ROA	-0.084*** (-7.471)	-0.089*** (-7.828)	-0.083*** (-7.327)	-0.085*** (-7.501)
FIRM AGE	-0.016 (-0.306)	0.022 (0.410)	-0.008 (-0.151)	0.003 (0.059)
TobinQ	-0.333*** (-19.510)	-0.317*** (-18.513)	-0.360*** (-20.613)	-0.336*** (-19.647)
DIVIDEND	-0.000*** (-5.104)	-0.000*** (-5.012)	-0.000*** (-4.838)	-0.000*** (-4.875)
LIQUIDITY	-1.111*** (-14.144)	-1.047*** (-13.015)	-1.122*** (-14.237)	-1.128*** (-14.302)
LT_DEBT	-5.852*** (-18.193)	-6.124*** (-18.655)	-5.899*** (-18.174)	-6.116*** (-18.722)
GRS	0.003** (2.294)	0.004** (2.229)	0.003** (2.240)	0.003** (2.175)
LEVERAGE	0.005*** (9.108)	0.005*** (9.164)	0.005*** (9.213)	0.005*** (9.319)
SIZE	-0.122*** (-17.615)	-0.093*** (-13.599)	-0.117*** (-16.011)	-0.144*** (-17.920)
GDP	-0.007 (-0.918)	-0.020*** (-2.623)	-0.005 (-0.629)	-0.000 (-0.051)
CONSTANT	9.191*** (49.456)	8.766*** (49.864)	8.805*** (50.629)	8.404*** (45.230)
Observations	26,157	25,105	26,151	26,157
Adjusted R ²	0.088	0.093	0.085	0.079
F-statistic	143.481***	151.568***	139.382***	127.204***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

(The table reports with symbols *, **, and *** indicate significance levels at 10%, 5% and 1% respectively)

Table 4 shows the regression result for the association between ESG and the SDROE- it is a measure of operational risk. When we utilize the standard deviation of ROE as our risk metric in model 1, we find a similar negative and substantial link between company risk and the aggregate ESG score (coefficient =-0.052; t=-12.865). Even when firm and country controls are implemented, this link remains important. At the 1% level, in model 1, model 2, model 3, individual components of environmental, social, governance (ESG) respectively, there show a similar negative and significant relationship between firm risk and the individual component of ESG.

Table 4. *ESG and Risk-taking Regression (SDROE proxy for Risk-taking)*

Independent Variables	Dependent Variables= SDROE			
	Model [1]	Model [2]	Model [3]	Model [4]
ESG	-0.052*** (-12.865)			
ENVIRONMENT		-0.033*** (-11.626)		
SOCIAL			-0.039*** (-11.160)	
GOVERNANCE				-0.010*** (-2.842)
ROE	0.027** (2.462)	0.024** (2.239)	0.027** (2.509)	0.025** (2.315)
FIRM AGE	-0.201* (-1.854)	-0.176 (-1.532)	-0.202* (-1.853)	-0.181* (-1.676)
TobinQ	-0.721*** (-18.981)	-0.692*** (-17.988)	-0.763*** (-19.923)	-0.723*** (-18.995)
DIVIDEND	-0.000*** (-5.993)	-0.000*** (-5.945)	-0.000*** (-5.868)	-0.000*** (-5.872)
LIQUIDITY	-0.040** (-2.305)	-0.039** (-2.248)	-0.041** (-2.310)	-0.038** (-2.117)
LT_DEBT	7.049*** (9.471)	6.961*** (9.086)	6.985*** (9.393)	6.442*** (8.663)
GRS	0.003** (2.167)	0.004** (2.379)	0.003** (2.159)	0.003** (2.310)
LEVERAGE	0.033*** (2.699)	0.032*** (2.689)	0.033*** (2.706)	0.033*** (2.679)
SIZE	-0.138*** (-8.819)	-0.095*** (-5.525)	-0.123*** (-7.643)	-0.174*** (-10.655)
GDP	0.037* (1.888)	0.024 (1.172)	0.039** (1.982)	0.045** (2.291)
CONSTANT	12.795*** (39.989)	11.904*** (39.115)	12.303*** (40.722)	11.292*** (34.234)
Observations	29,394	27,947	29,388	29,394

Independent Variables	Dependent Variables= SDROE			
	Model [1]	Model [2]	Model [3]	Model [4]
Adjusted R^2	0.037	0.036	0.036	0.032
F-statistic	77.888***	71.979***	72.872***	65.294***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

(The table reports with symbols *, **, and *** indicate significance levels at 10%, 5% and 1% respectively)

Results of robustness tests with various measures of corporate risk-taking reported in Table 5 show that ESG is still negatively related to measures of risk-taking. Following (Tran, 2019), we use the difference between maximum and minimum values of return on assets over a 5-year period. We find a constant negative and substantial link between our ESG metric and corporate risk-taking. Even when firm and country regulations are implemented, this link remains significant.

Table 5. *ESG and Risk-taking Regression (Max (ROA)-Min(ROA) proxy for Risk-taking)*

Independent Variables	Dependent Variables= Max (ROA)-Min(ROA)			
	Model [1]	Model [2]	Model [3]	Model [4]
ESG	-0.077***			
	(-17.276)			
ENVIRONMENT		-0.057***		
		(-19.070)		
SOCIAL			-0.052***	
			(-14.017)	
GOVERNANCE				-0.021***
				(-5.291)
ROA	-0.181***	-0.192***	-0.179***	-0.184***
	(-7.194)	(-7.569)	(-7.034)	(-7.222)
FIRM AGE	-0.056	0.044	-0.037	-0.010
	(-0.453)	(0.338)	(-0.300)	(-0.079)
TobinQ	-0.837***	-0.799***	-0.901***	-0.845***
	(-20.661)	(-19.640)	(-21.803)	(-20.790)
DIVIDEND	-0.000***	-0.000***	-0.000***	-0.000***
	(-5.071)	(-4.984)	(-4.810)	(-4.845)
LIQUIDITY	-2.623***	-2.478***	-2.649***	-2.662***
	(-13.806)	(-12.697)	(-13.888)	(-13.952)
LT_DEBT	-13.812***	-14.489***	-13.916***	-14.445***
	(-18.074)	(-18.546)	(-18.046)	(-18.604)
GRS	0.008**	0.010**	0.008**	0.008**
	(2.285)	(2.226)	(2.231)	(2.160)
LEVERAGE	0.016***	0.015***	0.016***	0.016***
	(9.761)	(9.783)	(9.847)	(10.002)
SIZE	-0.297***	-0.229***	-0.284***	-0.349***

Independent Variables	Dependent Variables= Max (ROA)-Min(ROA)			
	Model [1]	Model [2]	Model [3]	Model [4]
	(-17.805)	(-13.857)	(-16.196)	(-18.128)
GDP	-0.021	-0.054***	-0.016	-0.006
	(-1.181)	(-2.919)	(-0.893)	(-0.312)
CONSTANT	21.989***	20.950***	21.079***	20.084***
	(50.783)	(51.789)	(52.096)	(46.331)
Observations	26,167	25,110	26,161	26,167
Adjusted R ²	0.084	0.088	0.081	0.075
F-statistic	144.008***	150.575***	139.869***	127.521***
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

(The table reports with symbols *, **, and *** indicate significance levels at 10%, 5% and 1% respectively)

6. Conclusion

The main purpose of this paper is to empirically test the effect of ESG activity on risk-taking in an international context. From 1999 to 2019, we used 7451 publicly traded companies from 74 countries. For all publicly traded corporations available on the Thomson Reuter ESG database, we manually gather ESG, stock price, and other corporate financial data. We find that businesses with superior aggregated ESG performance considerably minimize the firm's risk-taking when using the Panel data model with the FGLS (Feasible Generalized Least Squares) technique. Furthermore, the individual ESG component (environmental, social, and governance) also shows the same negative and significance related to risk-taking at the 1% level. Firm features, on the other hand, have been linked to lesser risk-taking behavior in the past. Our empirical findings support our claims that ESG's impact on corporate risk-taking is a crucial mechanism via which ESG influences company value and our finding is consistent with previous studies (Harjoto & Laksmana, 2018; Jo & Harjoto, 2011; Mulia & Joni, 2019). Our suggestion for managers is that when focusing on the demands of stakeholders via ESG will be an effective strategy to lower the company's risks.

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