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Do ESG Investments Mitigate ESG Controversies? Evidence From International Data

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DO ESG INVESTMENTS MITIGATE ESG CONTROVERSIES? EVIDENCE FROM INTERNATIONAL DATA

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Abstract

Using an extensive international dataset based on Thomson Reuters environmental, social, and corporate governance (ESG) scores and controversies for an average of 7,175 companies in the period 2002–2018, this paper contributes to investigate how controversies may negatively affect market firm value and risk. This result can, however, be reversed in the case firms take advantage of high ESG scoring. In terms of policy implications findings suggest that controlling for ESG is important not only from a macro sustainability point of view but also from the individual firm perspective. Results are confirmed in the case of each single E, S and G pillars even though the social and governance dimension are statistically more significant in terms of controversies mitigation effects.

Keywords: ESG scoring; Controversy; Risk; Performance; Moderating effect.

JEL classification: G30; M14; Q56.

1. INTRODUCTION

A vast literature investigates how the environmental, social, and governance (hereafter ESG) factors affect both, together and separately, the value and risk of firms. To our knowledge only a few papers introduce the ESG controversies to explain firm's market value (Aouadi & Marsat, 2018), to explore financial portfolios performance (Dorfleitner et al., 2020) and to understand which are their determinants in the financial and banking sectors (Neitzert & Petras, 2021; Shakil et al., 2021). The aim of the present paper is to explore how on one side the value and risk of firms depend on the ESG controversies and on the other one how the ESG scoring may mitigate their negative effects.

The recent international debate among institutions and regulators on the importance of ESG investments for the transition towards global sustainable development (see among others OECD Business & Finance Outlook, 2020; World Economic Forum, 2021; EBA, 2021) contributes to generate two effects: i) on the one hand firms increase their ESG investments contributing to improve their ESG scoring; ii) on the other one citizens become more active in starting public or private ESG controversies with economic and reputational costs for firms.

Specifically, based on an extensive international sample of an average of 7,175 companies over the 2002-2018 span, we first examine how ESG scores impact on firm's value and risk-taking; then, a similar analysis is conducted to investigate the effect of ESG controversies on firm's value and risk-taking behavior. This paper contributes to analyse under which conditions the ESG investments may contribute to improve the firm market attractiveness both directly and indirectly mitigating the negative effects due to ESG controversies.

To the best of our knowledge, this study is the first attempt to offer a comprehensive framework that specifies theoretical and empirical connections between ESG controversies and risk-adjusted profitability at the international level both for financial and non-financial firms. In this paper, we argue that firms may assume ESG responsibility not only to generate spillover benefits to the worldwide community but also to achieve their own strategic goals. In this respect the opportunity to mitigate the effects of different controversies could be a spur to improve ESG investments in order to mitigate risk and increase economic performance.

The remainder of the paper is organized as follows. The second section summarises the existing literature and present arguments for the three tested hypotheses. Section three discusses the data and methodology. In Section four, we present the results. The last section concludes.

2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1 Theoretical background

The relation between firm corporate performance and ESG scores (which evaluate the performance of companies in the environmental, social, or corporate governance pillars) has been extensively analysed with mixed findings. From a theoretical point of view the stakeholder theory (Freeman, 1984) suggests that the ESG investments shift attention from shareholder-focused to stakeholder-focused governance reducing the management risk with a positive impact on the firm value. Similar results emerge also from the risk management theory based on which the ESG investments can generate positive moral capital among various stakeholders that can provide ‘‘insurance-like’’ protection for the firm. Godfrey (2005) claims that this moral capital induced by a positive assessment of a company’s corporate social performance leads stakeholders to hold on to positive attributions to a company, and positively affects the attitude and loyalty towards a company (Luo & Bhattacharya, 2009). This in turn alleviates stakeholders’ sanctions against a company in the event of a crisis and therefore leads to less volatile future cash flows and thereby reduced risk (Chang et al., 2014).

Differently, under the overinvestment hypothesis ESG investments lead firm to divert scarce resources from the maximization of shareholders' wealth, which squeezes out investment thereby reducing firm value (Alexander & Buchholz, 1978; Barnea & Rubin, 2010); it therefore predicts a negative impact of ESG on firm performance. ESG investments may also be perceived as agency costs because managers can improve their own reputation by investing in ESG at the expense of shareholders (Barnea & Rubin, 2010). If investors adopt this view, they may give greater relevance to the increase in firms' fixed costs associated with stronger ESG in which case investors may regard such firms as riskier (Drago et al., 2019). Based on the managerial opportunism theory a positive relationship between ESG measures and firm risk emerges (Bouslah et al., 2013). According to managerial opportunism theory, management predominantly pursues private goals (Preston & O’Bannon, 1997). Managers are incentivized by short-term profit objectives. In times of high corporate financial performance, they will underinvest in ESG responsibility to cash in, thereby condoning risks that occur in the long run. The contrary holds if corporate financial performance is low. Given certain conditions, managers who pursue their private goals in this way thus tend to overinvest in corporate social performance to improve their reputation as ‘‘good global citizens’’ (Barnea & Rubin, 2010) and, in so doing, increase firm risk.

2.2 The empirical evidence

2.2.1 The relationship between ESG scores and firm's financial performance and risk

From an empirical point of view a vast literature investigates the relationship between corporate financial performance and ESG scores for specific geographical or at the international level (Aouadi & Marsat, 2018; Buallay et al., 2021); moreover, a large strand of the literature investigates non-financial companies and only a few studies focus on financial and banking sectors (Buallay, 2020; Shakil et al., 2020). The evidence appears controversial with sometimes a positive impact of ESG efforts and CSR strategies on company performance, such as financial performance, employee commitment, innovation, and corporate reputation (Galema et al., 2008; Rettab et al., 2009; Servaes & Tamayo, 2013; Liu et al., 2014; Fatemi et al., 2015; Duque-Grisales & Augilera-Caracuel, 2019; Ghouri et al., 2019; Inigo & Albareda, 2019; Peng & Isa, 2020; Do & Kim, 2020; Sanchez et al., 2020; Huang, 2021). Based on more than 100 studies, Dam and Scholtens (2015) conclude that there is a positive association between social and financial performance and that little evidence exists of a negative association (Hillman & Keim, 2001; Brammer et al., 2006; Bird et al., 2007; Crisóstomo et al., 2011; Kim et al., 2018; Nirino et al., 2019; Albuquerque et al., 2019; Forgione et al., 2020); and some more studies show mixed results (Shakil et al., 2019). A different approach is proposed by Harjoto and Laksmana (2018) who examine the indirect mechanism through which ESG impacts positively on firm value; they report that it serves as a control mechanism to curb excessive risk with the impact on firm risk-taking decisions contributing to greater firm value (Mervelskemper & Streit, 2017; Yu et al., 2018). As for the banking sector studies of the impact of ESG engagement have mainly been with respect to financial performance and typically report a positive impact on profitability (e.g., Brogi & Lagasio, 2019; Shen et al., 2016; Simpson & Kohers, 2002), which might be expected to increase bank value. In the only bank-specific study of value that we are aware of, Bolton (2013) reports that high ESG engagement is associated positively with the value of US banks.

Further investigation on the direct effects of ESG pillars on firm risk-taking is becoming more and more important given that the financial crisis increased firm's financial constraints and indirectly their risk and the ESG investment could be a way to outweigh, at least partially, firm's risk due to market turbulence. Based on the stakeholder theory, higher ESG investment can enhance a company's reputation, suggesting that higher ESG scores leads to less financial risks (Luo & Bhattacharya, 2009) and therefore to a lower degree of stock market risk and a lower likelihood of company crisis (Oikonomou et al., 2012).

Most of the empirical evidence on ESG activities and firm risk relates to nonfinancial sector institutions produce mixed results.[1]

Oikonomou et al. (2012), for example, find that ESG-type engagement is negatively (but weakly) related to systematic risk in a panel data set of S&P 500 firms. Lee and Faff (2009) report that leading ESG firms exhibit significantly lower idiosyncratic risk. Moreover, Jo and Na (2012) find that ESG engagement inversely affects firm risk in "controversial industry" firms (including banks), that is, those that are socially undesirable, after controlling for firms' specific characteristics. Finally, Benlemlih et al. (2018) confirm a negative relation between ESG engagement and risk with reference to a sample of UK listed firms over the 2005-2013. Differently from previous literature this paper focuses on the impact of single E and S pillars on the firm's risk. The authors suggest that firms which make extensive and objective E and S disclosures promote corporate transparency that can help them build a positive reputation and trust with their stakeholders. This in turn can help mitigate the firms' idiosyncratic/operational risk. Their main results suggest a negative impact in terms of total and idiosyncratic risk while it is not statistically significant with respect to the beta. In a large international sample, Breuer et al. (2018) highlight that for countries with strong investor protection, the cost of equity decreases when a firm invests in CSR. Sassen et al. (2016) investigate the impact of the ESG factors on market-based firm risk measured by systematic, idiosyncratic, and total risk for a panel of 8752 European firms covering the period 2002–2014. Evidence suggests that higher ESG investments decreases total and idiosyncratic risk. More specifically the social performance has a significantly negative effect on all three risk measures. Environmental performance generally decreases idiosyncratic risk, whereas total risk and systematic risk are only affected in environmentally sensitive industries. In contrast, any significant effect of corporate governance performance on firm risk emerges. If on the one hand many studies produce ambiguous results on the relationship between ESG factors and risk more recent studies focusing on the different pillars produce more detailed evidence. Some studies suggest a negative relationship between environmental performance and firm risk (Salama et al., 2011; Sharfman & Fernando, 2008; Cai et al., 2016). Bouslah et al. 2013 show asymmetric results for subsamples showing a positive relationship during crisis periods suggesting social performance strengths are more useful in terms of risk reduction during adverse economic environments (e.g., financial crises, economic recessions). Gangi et al. (2020) highlight that corporate environmental responsibility enhances corporate reputation which in turn reduces firm's risk of financial distress. Xue et al. (2020) find that the environmental management performance (EMP) dimension of corporate environmental performance contributes mainly in reducing firm risk in the manufacturing

[1] See among others: Mishra & Modi, 2013; Lin et al., 2014; Chen et al. 2018; Cholleta, & Sandwidi, 2018).

sector. In the financial sector, Bolton (2013) reports a negative relationship between risk-taking and ESG activities of US banks, Gangi et al. (2019) report that environmentally conscious banks have lower levels of insolvency risk in a multi-country sample of 142 banks, and Neitzert and Petras (2021) report that ESG engagement reduces both default and portfolio risk in a sample of 3,392 banks from 121 countries.

Differently only a few papers show a positive relationship or a weakly negative relationship between ESG investment and risk. Mainly, Menz (2010) reports (weak) evidence that socially responsible firms face a higher risk premium in corporate bond markets; Goss and Roberts (2011) report that low-quality borrowers that engage in ESG face higher bank loan spreads and shorter maturities. Di Tommaso and Thornton (2020) with reference to a panel dataset of 81 banks headquartered in 19 European countries over 2007Q3 to 2018Q4 period find that high ESG scores are associated with a modest reduction in risk-taking for banks.

Based on the above considerations, we expect that the following hypothesis holds:

HP.1.: *ESG practices positively impact on firm's financial performance & risk.*

2.2.2 The relationship between corporate controversies and firm's financial performance and risk

To the best of our knowledge only a few papers have analysed the effects of ESG controversies in terms of performance and risk effects. We still know little about how and whether corporate controversies, which are strictly related to corporate social responsibility, impact firm performance and risk. Controversy can be defined as a dispute or scandal that involves a firm in actions or incidents that can adversely impact its stakeholders as well as the environment. Such negative events often give rise to negative publicity and pose a severe reputational risk to the firm. According to the literature scandals and controversies have the potential to negatively impact on company's reputation and as a consequence to generate a negative effect on company performance (Walsh et al., 2009).

Some studies expect ESG controversies to be associated with decreased firm value (Weigelt & Camerer, 1988; Fombrun & Shanley, 1990; Fombrun, 1996; Adams, 2002; Orlitzky, 2013). On the one side, according to the stakeholder theory ESG negative corporate controversies may trigger higher stakeholder skepticism and perceptions of corporate hypocrisy (Du et al., 2010; Maignan & Ralston, 2002), thus leading to lower credibility (Godfrey et al., 2009; Yoon et al., 2006) with a negative impact on the firm value. In this respect, Kim et al. (2018) show that when a firm

undertakes strategic actions aimed at improving ESG performance, it also enhances the firm's reputation in the eyes of its various stakeholders.

In a complementary way the widespread negative media coverage of ESG controversies, as well as the increasing level of stakeholder sensitivity to ESG issues (Maignan & Ferrell, 2004; Du et al., 2011) and allegations of suspicious behavior, may alter corporate identity and reputation (Donaldson & Preston, 1995) with negative effects in terms of firm legitimacy, and an indirectly negative effect on the firm value. Minor and Morgan (2011) show that enhanced CSR reputation protects firms from negative corporate news, thereby maintaining organizational legitimacy.

From an empirical point of view Oikonomou et al. (2012) confirm that CSR is negatively related to systematic risk and especially that CSR concerns are associated with higher systematic risk. Finally, Kang and Kim (2013) show that firms lose market share if the tone of CSR news articles about them in the previous year was negative. Aouadi and Marsat (2018) have investigated the relationship between ESG controversies and firm market value using a dataset of more than 3000 ESG controversies provided by Asset4 Thomson Reuters. They show that higher CSP score has an impact on market value (Tobin's Q) only for high-attention firms, located in countries with greater press freedom, more searched on the Internet, more followed by analysts, and with an improved corporate social reputation. Thus, these findings provide new insights on the role of firm visibility through which companies can profit from their CSP. In other terms, negative market news about the firm destroys reputation, which results in lower market value and increase in risk. The negative media coverage questions the legitimacy of the firm operations. In a similar vein, Darrien et al. (2021) show that, following the occurrence of negative ESG incidents, financial analysts revise downward their earnings forecasts. The change in earnings forecasts mostly generate a subsequent negative impact in stock price and market value of the firms in the occurrence of negative ESG news.

Li et al. (2019), suggest that, in case of disputes and controversies, a company establishes new CSR strategies to bring the relationship with stakeholders back to the pre-controversy level. Hence, companies use symbolic ESG strategies after an event to mitigate the negative impact in the short term. Focusing on environmental (E) and social (S) pillars Benlemlih (2018) investigate how their disclosure impacts on its risk. While they do not find any link between a firm's E and S disclosures and its systematic risk, a negative and significant association between these disclosures and a firm's total and idiosyncratic risk exists. These are novel findings and are consistent with the predictions of the stakeholder theory and the resource-based view of the firm suggesting that firms which make extensive and objective E and S disclosures promote corporate transparency that can help them build a positive reputation and trust with their stakeholders. This in turn can help mitigate the firms'

idiosyncratic/operational risk. These findings are important for all corporate stakeholders including managers, employees, and suppliers who have a significant economic interest in the survival and success of the firm. In terms of investors behaviour, negative ESG events seems generate significant negative market reactions (Ho et al., 2020; Scholtens & Witteveen, 2021; Serafeim & Yoon, 2022; Wong et. al., 2022). Empirical research also suggest that controversies produce higher reactions than positive ESG news (Capelle-Blancard & Petit, 2019) and that investors on average overreact to negative ESG events (Cui & Docherty, 2020). Moreover, institutional investors tend to reduce net order flow prior to firms' negative ESG incidents if the controversy eventually results in negative abnormal returns (Hoang et al., 2019).Based on the above considerations, we propose the following hypothesis:

HP.2.: *Corporate controversies negatively impact firm's financial performance & risk.*

2.2.3 The moderating role of ESG practices

Firms may strategically utilize CSR as means to repair reputational damage following a corporate controversy. In this respect, Li et al. (2019), investigate how firms' engagement in symbolic and substantive CSR may counterbalance negative impact of ESG controversies. Based on a sample of 9117 firm-year observations in an international setting, they find that firms are more likely to engage in symbolic CSR than substantive CSR and the relationship between the level of controversy and the firm's engagement in symbolic CSR is an inverted U. In other terms, market positively evaluates the symbolic CSR engagement following a corporate controversy.

Similarly, Nirino et al. (2021) investigate how corporate controversies impact firm performance considering the previous investment in ESG. By using a database of 356 European listed companies, linear regression models confirm a negative and significant relationship between corporate controversies and financial performance. The evidence suggests that a positive moderating effect of ESG practices on the relationship between controversies and financial performance is unlikely. The study contributes to the literature on CSR and stakeholder theory, shedding light on the negative consequences of controversies and indicating that, despite no mitigating effects of ESG practices on the controversies/performance relationship have been found, ESG practices are important for addressing stakeholders' needs. Regarding managerial implications, this study underlines that, controversies are detrimental for firm performance, and that ESG practices should not serve. Shakil et al. (2021) find ESG controversies moderates the relationship between ESG and firm's financial risk. Similarly, board gender diversity moderates the relationship

between ESG and firm's financial risk. Utz (2019) demonstrates that firms which experience a scandal, subsequently react with intensified strategic measures to improve their CSR.

Marsat et al. (2022) find clear evidence that prior high environmental performance (EP) significantly helps firms to recover quickly from an environmental controversy. In line with the natural resource-based view, high EP firms should develop environmental skills and reputation that foster resilience when facing such adverse events. Using an international dataset of 233 environmental controversies over the 2010-2016 period, they find clear evidence that prior high EP significantly helps firms recover more quickly from the shock. In a context of increasing pressure on environmental issues, this result uncovers new benefits of EP for firms confronted with an environmental controversy.

DasGupta (2021) examines whether financial performance shortfalls motivate firms to undertake improved ESG practices, possibly to maintain future legitimacy. It also investigates whether ESG controversies mediate firms' ESG decisions in such situations. It finds a strong positive influence of financial performance shortfall on firm's ESG performance. However, when such firms are constrained by high levels of ESG controversies, they are less likely to engage in higher ESG practices, although such controversies have positive mediating impact on the relationship between financial performance shortfalls and ESG performance.

In light of the above considerations, we propose the following hypothesis, outlined in Figure 1:

HP.3.: *ESG practices positively moderate the relationship between corporate controversies and financial performance & risk in the sense that higher ESG practices alleviate the negative effects of controversies on financial performance & risk.*

3. DATA AND METHODOLOGY

3.1. Data

We obtain accounting and financial data on listed companies with ESG coverage between January 1, 2002 and December 31, 2018 from Thomson Reuters (now Refinitiv). We only consider firms included in the ASSET4 universe directory as to the end of year 2018. Our final sample consists of 7,175 firms from 47 countries resulting in 57,316 firm-year observations. Data for ESG scores and ESG controversies are from the same source. Refinitiv provides a score for 10 categories that

contribute to generate the three ESG pillar scores-environmental, social and corporate governance.[2] The three pillar scores are then aggregated in order to obtain the overall Refinitiv ESG score. ESG controversies are environmental, social or corporate governance evidences of misconduct collected by Refinitiv based on publicly reported information. Refinitiv ESG controversies are counted for 23 different indicators which are classified into 7 sub-categories related to the one of the 3 ESG pillars Based on the numbers of controversies in sectors and countries an overall ESG Controversy score is usually also provided by Refinitiv for the specific firm covered. This score is a percentile ranking also benchmarked on the respective industry groups.[3] We identify 27,952 ESG controversies relating to 3,231 firms worldwide (45% of the total) involving 11,017 firm-year observations (19.22% of the total) over the 2002-2018 sample period.

3.2. Variables definition

3.2.1 Dependent variables

To measure firm value, we use the Market-to-Book (M/B) ratio, computed as the market capitalization of firm *i* at the end of 31 December of the fiscal year *t* divided by the book value of equity. Systematic risk is measured as the firm's market beta obtained from a standard CAPM model by regressing the firm's monthly excess return on the monthly excess return of the corresponding local market index over the previous 5 years. Monthly log-returns between month *t* and month *t-1* are computed using the stock or market *cum*-dividend total return index (Datastream item *RI*):

$$r_{i,t} - r_{f,t} = \alpha_i + b_i\left(r_{m,t} - r_{f,t}\right) + \varepsilon_{i,t} \quad (1)$$

In equation (1), $r_{i,t}$ is the return on security *i* for period *t*, $r_{f,t}$ is the local risk-free return, b_i is the systematic risk of security *i* (firm's beta or β), $r_{m,t}$ is the return on the value weighted local market portfolio and $\varepsilon_{i,t}$ is a zero-mean residual. Idiosyncratic risk (Merton, 1987; Ang et al., 2006; Ang et al., 2009; Lin et al., 2014), is obtained as the annualized standard deviation of the residuals of the Fama-French five-factor asset pricing model using previous year monthly excess returns (Fama & French 2015, 2017):

[2] For a detailed explanation on the data process and scores calculation methodology see: Refinitiv (2021), Environmental, social and governance (ESG) scores from Refinitiv, https://www.refinitiv.com/en/sustainable-finance/esg-scores.

[3] Environmental controversies include resource use issues, social controversies deal with firm's misbehaviors connected to community, human rights, product responsibility and workforce topics and corporate governance controversies involve management compensation and conflicts with shareholders negative news.

$$r_{i,t} - r_{f,t} = \alpha_i + b_i\left(r_{m,t} - r_{f,t}\right) + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + \varepsilon_{i,t} \quad (2)$$

In equation (2), $r_{m,t}$ - $r_{f,t}$ is the excess return on a regional (including firms listed in a developed or emerging market) value weighted market portfolio minus the U.S. one month T-bill rate, SMB_t is the return on a regional diversified portfolio of small stocks minus the return on a regional diversified portfolio of big stocks, HML_t is the difference between the returns on regional diversified portfolios of high and low book-to-market (B/M) stocks, RMW_t is the difference between the returns on regional diversified portfolios of stocks with robust and weak profitability, and CMA_t is the difference between the returns on regional diversified portfolios of low and high investment stocks, which Fama and French define conservative and aggressive.[4] For each firm we first run separate OLS regressions by using monthly data and replicate the estimation of equation (2) for every year of the sample. We then obtain the corresponding firm-month residuals and compute the annualized standard deviation of the residuals as $\sigma(\epsilon_{i,t}) \times \sqrt{n}$, where *n* represents the exact number of finite months of trading in the year. Total risk is computed as the annualized standard deviation of daily returns of firm *i* over year *t*: $\sigma(r_{i,t}) \times \sqrt{n}$ where *n* represents the actual number of trading days in the year.

3.2.2 ESG, Controversy and Control variables

ESG pillar scores evaluates a company's relative environmental, social and corporate governance "*performance, commitment* and *effectiveness*" (Refinitiv, 2021). Each pillar scores as well as the overall ESG score varies between 0 and 100. We adopt the convention to convert the final values of the scores in decimal points in order to simplify the interpretation of the estimated coefficients in our regression models. Refinitiv also records if a firm experienced a controversy during the fiscal year and the number of negative news related to environmental, social and governance topics. In order to taking into account the existence of a potential effect generated by a controversial event we consider a dummy variable that takes the value of 1 if a firm faced at least a controversy in a given year, and 0 otherwise. The value of the ESG Controversy score is expressed on a reverse decimal basis for a more convenient interpretation of the negative events that can affect a specific firm. By using such a transformation, the fewer controversies faced by the firms, the lower its score is. We extend our analysis by using an interaction term between the overall ESG score and the dummy Controversy variable to highlight any mediation effect. To control for firm-characteristics we add

[4] Data for ($R_{m,t}$ - $R_{f,t}$), SMB_t, HML_t, RMW_t, CMA_t and the U.S. one month T-bill rate used for the regional five-factor model are from Kenneth French's website: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

the following variables: *ROA* is the ratio of net income over total assets; *Age* is the natural logarithm of the difference between the year of incorporation and the year of observation; *Size* is the natural logarithm of total assets; *Leverage* is the ratio of total liabilities over total assets; *Capex* is the ratio of capital expenditures to total assets; *Asset growth* is relative variation of total asset between year *t* and *t-1*. We further control for country characteristics by adding *GDP growth* as the relative variation of the national GDP between year *t* and *t-1*. We describe the variables in table 1. All variables used in the models, except for the ESG scores and dummy variables, are winsorized at the 1% and 99% level and expressed in US dollar.

3.3. Methodology

Following the existing research, we first consider the effect of ESG score only. Subsequently, we include the effect of controversies on market-based performance and risk measure. Finally, we investigate whether, and to what extent, firm propensity towards ESG performance can mediate the negative effect of the controversy. To this end, we estimate three distinct econometric models. The first one presents the direct effect of ESG score only, the second model tests for the existence of a negative relationship between our dependent variable and ESG controversy, whereas the third model aims to establish the positive mediation role of ESG score in mitigating ESG controversy.

The three models can be described by the following equations, in which *y* = [market to book ratio, total risk, idiosyncratic risk, systematic risk] are the dependent variables:

$$y_{i,t} = \alpha_{i,t} + \beta_1 ESG\ Score_{i,t} + \sum_{k=1}^{7} \varphi_k X'_{i,t} + \sum_{t=2002}^{2018} \delta_t Year_t + \sum_{i=1}^{7175} \delta_i\, Firm_i + \sum_{c=1}^{47} \delta_c Country_c + \varepsilon_{i,t} \quad (3)$$

$$y_{i,t} = \alpha_{i,t} + \beta_1 Controversy_{i,t} + \sum_{k=1}^{7} \varphi_k X'_{i,t} + \sum_{t=2002}^{2018} \delta_t Year_t + \sum_{i=1}^{7175} \delta_i\, Firm_i + \sum_{c=1}^{47} \delta_c Country_c + \varepsilon_{i,t} \quad (4)$$

$$y_{i,t} = \alpha_{i,t} + \beta_1 Controversy_{i,t} + \beta_1 ESG\ Score_{i,t} + \beta_3 ESG\ Score_{i,t} \times Controversy_{i,t} + \sum_{k=1}^{7} \varphi_k X'_{i,t} + \sum_{t=2002}^{2018} \delta_t Year_t + \sum_{i=1}^{7175} \delta_i\, Firm_i + \sum_{c=1}^{47} \delta_c Country_c + \varepsilon_{i,t} \quad (5)$$

where *i* represents the individual firm observation belonging to the sample (*i* = 1, 2, 3, …, 7175); *t* indicates time (*t* = 2002, …, 2018); β represents the parameters to be estimated; and X' is a vector of control variables that includes firm and country characteristics based on findings in the prior literature. Both constant and error terms are included in the model.

The multivariate panel models incorporate also firm, year and country fixed effects. Standard errors are clustered by firm and the regressions are estimated separately for value and risk measures.

The effect of overall ESG score on firm's value, idiosyncratic, total and systematic risk is estimated in model (3) by using $ESG\ Score_{i,t}$, the firm's *i* ESG score expressed on percent basis In model (4) the likely negative impact of controversies on firm's *i* value and risk at time *t* is measured by the dummy variable $Controversy_{i,t}$. Model (5) further investigates the effect of controversies by adding the interaction term $ESG\ Score_{i,t}$ x $Controversy_{i,t}$, that indicates if the negative effect of the controversy is at least partially mitigated by the ESG score. In order to evaluate if the individual factors that make up the general controversy and ESG score (environmental, social and governance) can differently impact our dependent variables (performance/risk) or differently moderate the relationship between performance and controversy, in models 3, 4 and 5 we then substitute the general controversy variable and ESG aggregated score with the ones associated to each individual pillar, i.e.: environmental, social and governance.

4. EMPIRICAL RESULTS

4.1. Descriptive statistics

Table 2 shows the descriptive statistics of our sample. Market-to-Book ratio has a mean (median) value of 2.95 (1.90) with a high degree of dispersion given by a 3.40 of standard deviation. Idiosyncratic risk is on average equal to 0.19 with a range of yearly values between 0.04 and 0.71, mean value of total risk is 0.37 and the average systematic risk (stock's beta) is equal to 1.07. Concerning the ESG scores, the mean value of the overall ESG score is almost exactly equal to 0.40 with a standard deviation of approximately 20%. Of the three pillars, the Governance score has the highest mean value (0.48) followed by the Social score (0.39) and the Environment score (0.30). The ESG Controversy score is quite low in magnitude equals to 0.08. Yearly average ROA is 5.50 % with a maximum of 38.00 % and a minimum of -47.20 %. Firms' average age (expressed in levels) is 38,7 years (median 27 years). The average firm's size (expressed in term of total assets) varies from 7.76 million of US dollar to 356 billion of US dollar, with a mean value of 24.5 billion (median of 5,1 billion). Financial and non-financials liabilities account on average for 57% of total

assets with a standard deviation of 23,3%. Firms in the sample exhibit a yearly average rate of capital expenditures equal to 4,7% (median 3,2%) and a positive tendency to increase the value of total assets with a mean (median) annual growth rate of 10,4% (5,3%). At a country level, the yearly average growth of GDP ranges from -4.3% to 10.6% with a mean value of 2.2%. The distribution of our sample firms across countries, geographical regions, industries, and years is presented in Appendix A. Panel A of the appendix shows that the United States has the largest number of firms (2,876), followed by Australia (496), United Kingdom (475), Japan (467), Canada (401) and China (300). The smallest number of firms included in the sample belongs to Portugal and Qatar (14), Egypt (12), Czech Republic and Pakistan (5) and Hungary (4), respectively. Panel B highlights that North America (3,277), Asia-Pacific (2,009) and Europe (1,387) account for the large majority of firms and the number of firms with non-missing observations located in developed countries is much higher than in emerging countries (5,871 and 1,304, respectively). Financials, Industrials and Consumer Cyclicals industries have the highest numbers of firms covered and firm-year observations, accounting together for nearly 50% of the overall sample as shown in Panel C. The number of firm-year observations increases steadily during the sample period reaching its peaks in 2017 and 2018. In appendix B we shed further light on the distribution of ESG controversies. The vast majority of negative news are related to the social category (25,419 controversies or 90.9%). Governance and Environmental controversies account for the remaining 6,6% and 2,5%, respectively. Controversies are more likely to occur in North America, Europe and in the Asia-Pacific region and for firms located in developed countries, mimicking the distribution of firm-year observations. Financials, Consumer Cyclicals and Industrials firms seems to be more affected by controversies. Not surprisingly, for the Basic Materials, Energy and Utilities industries the number of controversies related to environmental issues is higher than the corporate governance category.

4.2. Research findings

Table 3 reports the effect of ESG score (Hp.1), controversies (Hp.2) and the mediation role of ESG score (Hp.3) on market-based performance and risk measure. The results associated with the three hypotheses on market to book ratio, idiosyncratic risk, total risk and systematic risk are reported from columns (1) to (12). The results of columns (1) confirm that ESG score positively affect market to book ratio and decrease idiosyncratic and total risk (columns 4 & 8) confirming hypothesis 1 except for systematic risk when the coefficient is not significant (β_1 = -0.0373; p > 0.1). The remaining columns of Table 3 enables us to test whether, and to what extent, controversy

can affect market-based performance and risk measure (Hp. 2) and if a positive mediation role of ESG score can be established, thus mediating the negative effect of the controversy (Hp. 3)

Controversy negatively and significantly impacts market value (β_1= -0.1401; $p < 0.01$): in the presence of a controversy, the performance is lower of about -0.14%. In terms of risk (columns 5, 8, 11), controversy positively affect idiosyncratic ($\beta_1 = 0.0068$; $p < 0.01$) and total risk ($\beta_1 = 0.0104$; $p < 0.01$). In all cases, we confirm a negative and significant relationship between corporate controversies and financial performance and risk. Once more, no statistical relationship is detected for systematic risk (column 11).

When Controversy dummy interacts with the ESG score, as in Eq. (5), this provides the basis for the estimate of two different population regression functions relating to market-based performance and risk measure on the one hand (Y) and the ESG score on the other.

Turning to the mediation role (columns 3, 6, 9, 12) Controversy negatively affects financial performance ($\beta_1 = -0.2849$; $p < 0.01$) and the risk variables (total: ($\beta_1 = 0.0195$; $p < 0.01$; idiosyncratic: ($\beta_1 = 0.0163$; $p < 0.01$) except for the systematic risk. In case of controversy (Dummy controversy=1) performance decrease of about 0.2849% while total risk increases of 0.0195% respect the case when no controversy is detected. The interaction term implies two different marginal effect of ESG score variation on our dependent variables depending on the presence of controversy or not. In the case of no controversy, the positive variation in performance for a unit variation of the ESG score is equal to 0.6337; in the case of a controversy 0.2941 represents the mediation effect of ESG score. The results for the control variables are in line with our expectations thus conforming the prevalent literature except, a less significant impact on idiosyncratic and systemic risk can be found for Age, Size, Capex and asset growth.

In the following tables, we evaluate if the mediation effect changes in relation to the different individual pillar - E, S, G – (Table 4), to the level of gravity of the controversy (table 5), to the country stage of development (Table 6 – Panel A) and to the firm sector (Table 6 – Panel B). Hereafter, the control variables will be skipped from the tables to ensure greater readability since the expected signs are always confirmed[5].

In Table 4, we replicate the empirical analysis of Table 3 at the individual pillar level. Table 4 shows the single E, S and G controversies dummies, the relative E, S and G score and the results of the interaction between the single E, S and G dummies and the relative E, S and G scoring. The evidence underlines that the individual pillar score positively and significantly affects market value (columns 1, 5, 9), while decreasing idiosyncratic and total risk. In all specifications, the highest impact can be found for the social pillar.

[5] Results are available upon request to the authors

Turning to the role of controversies, while social and governance controversies confirm the overall results of Table 3, decreasing market value and increasing idiosyncratic and total risks with governance controversies affecting more dependent variables respect social ones, environmental controversies do not play a significant role in affecting performance and risk measures. In other words, results suggest that the Environmental controversies are completely ineffective on market variables; differently the most important impacts derive from the social and governance channels expect for the Beta.

Turning to the mediation role of individual pillar score in case of controversy, thus investigating how the effect of investment in ESG summarized by the ESG score can outweigh the negative effects produced by the ESG controversies, the evidence suggests that only in the case of the social score, it more than compensates the controversy effect both for returns and risk variables. In case of the environmental pillar, no mediation role can be found. The situation for the governance dimension is mixed: only in case of idiosyncratic risk a mediation role can be pointed out.

In all specifications, it is also evident that controversy, score and interaction don't affect the Beta non-diversifiable market risk. This is probably linked to the fact that ESG factors are not completely captured by the market dimension in the short period.

In Table 5 we decide to reverse the scale of the ESG controversy scores by taking the negative value so that the related controversy is less favourable to the firm if it receives a higher score. Our objective is to evaluate if the main results in Table 3 still hold regardless the level of gravity of the negative ESG event. We therefore generate different level of controversy gravity by creating 5 dummy variables for increasing values of the reverse Controversy Score (from -100 to 0). We then interact the general ESG score variable with each of the dummy Gravity variable (ESG Controversies Score 1 to 5) and assess if the mediating role of the ESG score operates from low to extremely serious gravity of the controversy. Our results suggest that ESG score alleviate the negative effect of ESG Controversy only for low and moderate level of controversy gravity.

Results from emerging/developed countries (Table 6 – Panel A) signal that only in case of developed countries a moderating role can be detected (columns 2, 4, 6), both in terms of increasing performance and lowering risk (except for Beta). For firm sector (Table 6 – Panel B) the results suggest that moderating role is always evident for non-financial companies while, for financial ones, the ESG score can outweigh the negative effects produced by the ESG controversies in case of total and idiosyncratic risk, while no effect can be found for market value.

5. CONCLUSION

This work offers a comprehensive framework that specifies theoretical and empirical connections between ESG controversies and risk-adjusted profitability at the international level both for financial and non-financial firms. In this paper, we argue that firms may assume ESG responsibility not only to generate spillover benefits to the worldwide community but also to achieve their own strategic goals. In this respect the opportunity to mitigate the effects of different controversies could be a spur to improve ESG investments in order to mitigate risk and increase economic performance.

The results of our analysis point out that controversy negatively and significantly impact market value while positively affect idiosyncratic and total risk. Turning to the role of controversies at the individual pillar level, while social and governance controversies confirm the overall results, with governance controversies affecting more dependent variables respect social ones, environmental controversies do not play a significant role in affecting performance and risk measures. In other words, results suggest that the Environmental controversies are completely ineffective on market variables; differently the most important impacts derive from the social and governance channels.

ESG score positive affect market to book ratio and decrease idiosyncratic and total risk; once more, no statistical relationship is detected for systematic risk. The evidence holds also at the individual pillar level with the highest impact can be found for the social pillar.

The investigation of how the effect of investment in ESG summarized by the ESG score can outweigh the negative effects produced by the ESG controversies reveals that at the general level it more than compensates the controversy effect both for returns and risk variables, but the result holds only in case of low and moderate level of controversy's gravity.

At the individual pillar level, only in the case of the social score the mediation role is confirmed both for returns and risk variables. The situation for the governance dimension is mixed: only in case of idiosyncratic risk a mediation role can be pointed out, while in the case of the environmental pillar, no mediation role can be found.

In terms of policy implications findings suggest that controlling for ESG is important not only from a macro sustainability point of view but also from the individual firm perspective.

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TABLE 1 - VARIABLE DEFINITIONS

Market-based Characteristics

Market-to-Book	Market to book ratio computed as market capitalization on December 31st of the fiscal year divided by the book value of equity. Negative values are excluded. *Source*: Refinitiv Worldscope
Total risk	Annualized standard deviation in current year *t* of daily stock returns for firm *i*. *Source*: Refinitiv Datastream
Idiosyncratic risk	Annualized standard deviation of Fama-French 5-factor model's residuals in current year *t* using monthly excess returns for firm *i*. *Source*: Refinitiv Datastream and Kenneth R. French Data library (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)
Systematic risk	Market beta (from a local CAPM model using national stock market index) in current year *t* based on monthly stock excess returns for firm *i*. *Source*: Refinitiv Datastream

ESG & Controversies Characteristics

ESG Score	The overall company ESG score measures the company's performance on environmental, social and corporate governance pillars. *Source*: Refinitiv ESG
Environmental Score	The weighted average relative rating of a company based on the reported environmental information and the resulting three environmental category scores. *Source*: Refinitiv ESG
Social Score	The weighted average relative rating of a company based on the reported social information and the resulting four social category scores. *Source*: Refinitiv ESG
Governance Score	The weighted average relative rating of a company based on the reported governance information and the resulting three governance category scores. *Source*: Refinitiv ESG
ESG Controversy Score	ESG controversies category score measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media. *Source*: Refinitiv ESG
Controversy	Dummy variable equal to 1 if firm *i* is involved in a recent ESG controversy; 0 otherwise. *Source*: Refinitiv ESG
ESG Score x Controversy	Interaction between the overall company *ESG score* and the *Controversy* dummy variable. *Source*: Refinitiv ESG
$Score_{(E)}$ *x* $Controversy_{(E)}$	Interaction between the company *Environmental score* and a dummy variable, $Controversy_{(E)}$ equal to 1 if the firm is involved in a recent environmental controversy and 0 otherwise. *Source*: Refinitiv ESG
$Score_{(S)}$ *x* $Controversy_{(S)}$	Interaction between the company *Social score* and a dummy variable, $Controversy_{(S)}$ equal to 1 if the firm is involved in a recent social controversy and 0 otherwise. *Source*: Refinitiv ESG
$Score_{(G)}$ *x* $Controversy_{(G)}$	Interaction between the company *Governance score* and a dummy variable, $Controversy_{(G)}$ equal to 1 if the firm is involved in a recent governance controversy and 0 otherwise. *Source*: Refinitiv ESG
ESG Controversies Score (1-5)	5 dummy variables for increasing value of controversy gravity

Firm and Country Characteristics

ROA	Return on assets ratio computed as the net income divided by the total assets. *Source*: Refinitiv

	Worldscope
Age	Natural logarithm of the current age of firm *i* in year *t* of observation. Current age is computed as the difference between the firm's *i* year of incorporation and year *t. Source*: Refinitiv Worldscope and Bureau van Dijk.
Size	Natural logarithm of total assets. *Source*: Refinitiv Worldscope.
Leverage	Ratio computed as total liabilities divided by total assets. *Source*: Refinitiv Worldscope
Capex	Ratio computed as capital expenditures divided by total assets. *Source*: Refinitiv Worldscope
Asset Growth	Ratio computed as the difference of total assets at year *t* and *t-1* divided by total assets at year *t-1*. *Source*: Refinitiv Worldscope
GDP Growth	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. *Source*: World Bank national accounts data

TABLE 2 - DESCRIPTIVE STATISTICS

	N	mean	median	sd	min	max	skewness	kurtosis
Market-to-Book	56,181	2.950	1.896	3.402	0.305	23.325	3.601	18.944
Total risk	57,316	0.367	0.319	0.182	0.134	1.136	1.736	6.739
Idiosyncratic risk	57,063	0.192	0.161	0.120	0.042	0.713	1.860	7.352
Systematic risk	57,225	1.067	0.992	0.878	-1.580	4.326	0.620	5.544
ESG Score	57,316	0.399	0.372	0.207	0.000	0.954	0.384	2.273
Environmental Score	57,307	0.303	0.235	0.286	0.000	0.991	0.551	2.002
Social Score	57,316	0.394	0.362	0.235	0.000	0.992	0.405	2.296
Governance Score	57,316	0.481	0.481	0.227	0.002	0.996	0.013	2.054
ESG Controversy Score	56,511	0.913	1.000	0.212	0.000	1.000	-2.617	8.723
ROA	57,316	0.055	0.051	0.110	-0.472	0.380	-1.194	9.689
Age	57,316	3.250	3.258	0.974	0.000	4.990	-0.512	3.138
Size	57,316	15.521	15.428	1.736	11.325	20.329	0.238	3.169
Leverage	57,316	0.574	0.574	0.233	0.054	1.151	-0.022	2.520
Capex	57,316	0.047	0.032	0.050	0.000	0.275	2.085	8.326
Asset Growth	57,316	0.104	0.053	0.289	-0.399	1.849	3.220	18.047
GDP Growth	57,316	0.022	0.022	0.022	-0.043	0.106	0.022	0.022

TABLE 3 - CONTROVERSIES, ESG SCORES AND MEDIATION EFFECT ON VALUE AND RISK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	**Market-to-Book**			**Idiosyncratic risk**			**Total risk**			**Systematic risk**		
ESG Score	0.6819***		0.6337***	-0.0251***		-0.0211***	-0.0324***		-0.0295***	-0.0556		-0.0373
	(4.52)		(4.13)	(-4.64)		(-3.78)	(-4.08)		(-3.67)	(-1.30)		(-0.84)
Controversy		-0.1401***	-0.2849***		0.0068***	0.0163***		0.0104***	0.0195***		-0.0004	0.0229
		(-4.89)	(-3.72)		(5.76)	(5.31)		(6.83)	(4.94)		(-0.04)	(0.82)
ESG Score x Controversy			0.2941*			-0.0197***			-0.0188***			-0.0489
			(1.96)			(-3.60)			(-2.58)			(-1.00)
ROA	6.1832***	6.1890***	6.1655***	-0.1720***	-0.1701***	-0.1693***	-0.2809***	-0.2793***	-0.2782***	-0.4071***	-0.4004***	-0.3986***
	(21.96)	(21.9)	(21.86)	(-17.24)	(-17.08)	(-17.01)	(-21.38)	(-21.26)	(-21.19)	(-5.21)	(-5.12)	(-5.10)
Age	-0.2847***	-0.2696***	-0.2742***	-0.0015	-0.002	-0.0019	-0.0070*	-0.0078**	-0.0076**	-0.1052***	-0.1045***	-0.1044***
	(-3.56)	(-3.37)	(-3.42)	(-0.56)	(-0.75)	(-0.71)	(-1.88)	(-2.09)	(-2.03)	(-4.58)	(-4.54)	(-4.54)
Size	-1.2282***	-1.1962***	-1.2211***	-0.0241***	-0.0253***	-0.0244***	-0.0314***	-0.0331***	-0.0319***	0.0169	-0.0148	-0.0164
	(-20.69)	(-20.30)	(-20.57)	(-13.10)	(-13.68)	(-13.29)	(-12.42)	(-13.02)	(-12.61)	(1.17)	(-1.04)	(-1.15)
Leverage	9.2055***	9.2284***	9.2238***	0.0793***	0.0793***	0.0795***	0.1141***	0.1129***	0.1130***	0.1459***	0.1467***	0.1471***
	(27.85)	(27.81)	(27.87)	(10.8)	(10.81)	(10.84)	(11.52)	(11.41)	(11.43)	(2.61)	(2.61)	(2.62)
Capex	3.3305***	3.3350***	3.3005***	-0.1460***	-0.1447***	-0.1434***	-0.2072***	-0.2049***	-0.2033***	-0.1538	-0.1511	-0.1482
	(7.69)	(7.66)	(7.59)	(-6.92)	(-6.84)	(-6.79)	(-8.03)	(-7.92)	(-7.88)	(-0.99)	(-0.96)	(-0.95)
Asset Growth	0.2092***	0.1949***	0.2032***	-0.0012	-0.0003	-0.0006	-0.0089***	-0.0076***	-0.0080***	-0.0231	-0.0218	-0.0223
	(4.21)	(3.91)	(4.07)	(-0.54)	(-0.14)	(-0.27)	(-3.68)	(-3.13)	(-3.29)	(-1.25)	(-1.17)	(-1.19)
GDP Growth	0.0830***	0.0823***	0.0827***	-0.0029***	-0.0028***	-0.0029***	-0.0064***	-0.0064***	-0.0064***	-0.0082***	-0.0082***	-0.0082***
	(9.71)	(9.61)	(9.66)	(-6.49)	(-6.42)	(-6.44)	(-10.52)	(-10.46)	(-10.48)	(-3.15)	(-3.16)	(-3.16)
Constant	16.7755***	16.5198***	16.6706***	0.5580***	0.5663***	0.5606***	0.8657***	0.8790***	0.8713***	1.1392***	1.1424***	1.1319***
	(18.89)	(18.57)	(18.74)	(19.41)	(19.65)	(19.55)	(22.42)	(22.68)	(22.62)	(5.01)	(5.01)	(4.96)
Firm-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	56,640	56,514	56,514	57,135	57,012	57,012	57,441	57,316	57,316	57,336	57,211	57,211
N. Firms	7,113	7,095	7,095	7,127	7,110	7,110	7,192	7,175	7,175	7,165	7,148	7,148
R-squared	0.77	0.77	0.771	0.553	0.553	0.554	0.742	0.742	0.743	0.296	0.296	0.296
Adj. R-squared	0.737	0.737	0.737	0.489	0.489	0.489	0.705	0.705	0.705	0.195	0.195	0.195

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

TABLE 4 - ENVIRONMENT, SOCIAL AND GOVERNANCE MEDIATION EFFECT ON VALUE AND RISK

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Environment pillar				Social pillar				Governance pillar		
VARIABLES	**M/B**	**IR**	**TR**	**SR**	**M/B**	**IR**	**TR**	**SR**	**M/B**	**IR**	**TR**	**SR**
$Score_{(E, S, G)}$	0.2915***	-0.0120***	-0.0124**	-0.0485	0.3729***	-0.0118***	-0.0208***	-0.0496	0.1942**	-0.0110***	-0.0129***	0.0276
	(2.80)	(-3.26)	(-2.25)	(-1.54)	(3.10)	(-2.69)	(-3.37)	(-1.42)	(2.11)	(-3.33)	(-2.88)	(1.01)
$Controversy_{(E, S, G)}$	-0.0315	0.0153	0.0239	0.0662	-0.2457***	0.0098***	0.0150***	0.0194	-0.3352*	0.0358***	0.0413***	0.0305
	(-0.17)	(0.96)	(1.12)	(0.45)	(-3.68)	(3.56)	(4.24)	(0.78)	(-1.84)	(4.27)	(3.85)	(0.40)
$Score_{(E, S, G)}$ x $Controversy_{(E, S, G)}$	0.1716	-0.0145	-0.0204	-0.1866	0.2243*	-0.0085*	-0.0111*	-0.0312	0.2866	-0.0313**	-0.0265	-0.0670
	(0.61)	(-0.65)	(-0.66)	(-0.88)	(1.69)	(-1.82)	(-1.75)	(-0.73)	(1.06)	(-2.54)	(-1.62)	(-0.59)
ROA	6.2085***	-0.1711***	-0.2808***	-0.4002***	6.1814***	-0.1701***	-0.2791***	-0.3984***	6.1945***	-0.1697***	-0.2790***	-0.4018***
	(21.95)	(-17.16)	(-21.36)	(-5.12)	(21.87)	(-17.07)	(-21.22)	(-5.10)	(21.92)	(-17.06)	(-21.33)	(-5.14)
Age	-0.2783***	-0.0017	-0.0075**	-0.1046***	-0.2709***	-0.0019	-0.0077**	-0.1046***	-0.2759***	-0.0018	-0.0075**	-0.1052***
	(-3.47)	(-0.64)	(-2.00)	(-4.54)	(-3.39)	(-0.72)	(-2.05)	(-4.54)	(-3.45)	(-0.67)	(-2.00)	(-4.57)
Size	-1.2138***	-0.0246***	-0.0323***	-0.0169	-1.2088***	-0.0248***	-0.0323***	-0.0163	-1.2084***	-0.0246***	-0.0322***	-0.0137
	(-20.41)	(-13.27)	(-12.66)	(1.19)	(-20.53)	(-13.49)	(-12.78)	(1.15)	(-20.39)	(-13.44)	(-12.82)	(0.96)
Leverage	9.2228***	0.0796***	0.1133***	0.1459***	9.2260***	0.0794***	0.1129***	0.1468***	9.2278***	0.0794***	0.1130***	0.1467***
	(27.81)	(10.82)	(11.42)	(2.60)	(27.85)	(10.82)	(11.41)	(2.62)	(27.81)	(10.83)	(11.44)	(2.61)
Capex	3.3619***	-0.1465***	-0.2050***	-0.1504	3.3095***	-0.1442***	-0.2038***	-0.1471	3.3324***	-0.1442***	-0.2041***	-0.1528
	(7.71)	(-6.91)	(-7.92)	(-0.96)	(7.61)	(-6.82)	(-7.89)	(-0.94)	(7.65)	(-6.82)	(-7.90)	(-0.98)
Asset Growth	0.2053***	-0.0008	-0.0081***	-0.0228	0.1962***	-0.0004	-0.0077***	-0.0218	0.2028***	-0.0007	-0.0081***	-0.0213
	(4.11)	(-0.34)	(-3.34)	(-1.22)	(3.94)	(-0.18)	(-3.18)	(-1.17)	(4.06)	(-0.33)	(-3.35)	(-1.14)
GDP Growth	0.0836***	-0.0029***	-0.0064***	-0.0083***	0.0825***	-0.0029***	-0.0064***	-0.0082***	0.0825***	-0.0029***	-0.0064***	-0.0082***
	(9.73)	(-6.53)	(-10.53)	(-3.21)	(9.64)	(-6.45)	(-10.49)	(-3.16)	(9.62)	(-6.43)	(-10.46)	(-3.18)
Constant	16.7024***	0.5597***	0.8718***	1.1260***	16.5715***	0.5640***	0.8754***	1.1375***	16.6115***	0.5614***	0.8725***	1.1485***
	(18.68)	(19.38)	(22.42)	(4.94)	(18.65)	(19.60)	(22.64)	(4.99)	(18.68)	(19.61)	(22.72)	(5.04)
Firm-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country -fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	56,505	57,003	57,307	57,202	56,514	57,012	57,316	57,211	56,514	57,012	57,316	57,211
N. Firms	7,094	7,109	7,174	7,147	7,095	7,110	7,175	7,148	7,095	7,110	7,175	7,148
R-squared	0.770	0.553	0.742	0.297	0.771	0.553	0.742	0.296	0.770	0.554	0.743	0.296
Adj. R-squared	0.737	0.489	0.705	0.195	0.737	0.489	0.705	0.195	0.737	0.489	0.705	0.195

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

TABLE 5 - NET ESG SCORE-CONTROVERSIES LEVELS EFFECT, VALUES AND RISK

VARIABLES	(1) MBV	(2) 5FF	(3) VOL	(4) BETA
ESG Score	0.6911***	-0.0243***	-0.0336***	-0.0491
	(4.55)	(-4.43)	(-4.20)	(-1.13)
Controversy	-0.1672***	0.0093***	0.0114***	0.0002
	(-4.24)	(5.28)	(5.23)	(0.01)
ESG Score x ESG Controversies Score 1	0.2690***	-0.0168***	-0.0144***	-0.0098
	(2.96)	(-4.63)	(-3.15)	(-0.29)
ESG Score x ESG Controversies Score 2	0.1552	-0.0097**	-0.0088*	-0.0030
	(1.59)	(-2.42)	(-1.75)	(-0.08)
ESG Score x ESG Controversies Score 3	-0.0335	-0.0020	0.0029	0.0077
	(-0.34)	(-0.44)	(0.51)	(0.19)
ESG Score x ESG Controversies Score 4	-0.0537	-0.0033	0.0052	-0.0044
	(-0.52)	(-0.72)	(0.89)	(-0.11)
ESG Score x ESG Controversies Score 5	-0.1450	0.0038	0.0106	0.0122
	(-1.14)	(0.82)	(1.70)	(0.29)
ROA	6.1530***	-0.1687***	-0.2774***	-0.3984***
	(21.86)	(-16.96)	(-21.15)	(-5.10)
Age	-0.2768***	-0.0018	-0.0074**	-0.1040***
	(-3.46)	(-0.66)	(-1.98)	(-4.52)
Size	-1.2257***	-0.0241***	-0.0316***	0.0168
	(-20.62)	(-13.16)	(-12.52)	(1.18)
Leverage	9.2342***	0.0791***	0.1126***	0.1464***
	(27.88)	(10.80)	(11.40)	(2.61)
Capex	3.2987***	-0.1434***	-0.2032***	-0.1491
	(7.59)	(-6.79)	(-7.87)	(-0.95)
Asset Growth	0.2038***	-0.0006	-0.0080***	-0.0225
	(4.09)	(-0.28)	(-3.30)	(-1.20)
GDP Growth	0.0826***	-0.0029***	-0.0064***	-0.0082***
	(9.64)	(-6.44)	(-10.48)	(-3.17)
Constant	16.7246***	0.5581***	0.8684***	1.1293***
	(18.79)	(19.45)	(22.54)	(4.95)
Firm-fixed effect	YES	YES	YES	YES
Year-fixed effect	YES	YES	YES	YES
Country -fixed effect	YES	YES	YES	YES
Observations	56,514	57,012	57,316	57,211
N. Firms	7,095	7,110	7,175	7,148
R-squared	0.7708	0.5538	0.7427	0.2965
Adj. R-squared	0.7375	0.4895	0.7054	0.1948

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 6 - MEDIATION EFFECT ON VALUE AND RISK FOR DIFFERENT SUB-SAMPLES

Part A - Emerging and developed countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Market-to-Book		**Idiosyncratic risk**		**Total risk**		**Systematic risk**	
VARIABLES	**Emerging**	**Developed**	**Emerging**	**Developed**	**Emerging**	**Developed**	**Emerging**	**Developed**
ESG Score	0.1660	0.7682***	-0.0361**	-0.0182***	-0.0414**	-0.0293***	0.0101	-0.0598
	(0.51)	(4.52)	(-2.32)	(-3.03)	(-1.98)	(-3.37)	(0.13)	(-1.20)
Controversy	0.0109	-0.2984***	0.0151*	0.0165***	0.0236**	0.0184***	-0.1012*	0.0370
	(0.09)	(-3.52)	(1.72)	(5.06)	(2.00)	(4.40)	(-1.69)	(1.22)
ESG Score x Controversy	0.0016	0.2979*	-0.0087	-0.0221***	-0.0162	-0.0199***	0.1099	-0.0694
	(0.01)	(1.78)	(-0.53)	(-3.80)	(-0.72)	(-2.60)	(1.03)	(-1.29)
(*control variables omitted*)								
Firm-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Year-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Country -fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	8,647	47,867	8,595	48,417	8,656	48,660	8,630	48,581
N. Firms	1,307	5,788	1,290	5,820	1,304	5,871	1,297	5,851
R-squared	0.854	0.758	0.459	0.568	0.726	0.747	0.335	0.293
Adj. R-squared	0.826	0.725	0.360	0.508	0.675	0.712	0.212	0.195

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

Part B - Financials and non-financials firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Market-to-Book		**Idiosyncratic risk**		**Total risk**		**Systematic risk**	
VARIABLES	**Fin.**	**Non-Fin.**	**Fin.**	**Non-Fin.**	**Fin.**	**Non-Fin.**	**Fin.**	**Non-Fin.**
ESG Score	0.5881***	0.5556***	-0.0208	-0.0184***	-0.0368*	-0.0222***	0.0251	-0.0318
	(3.33)	(2.93)	(-1.61)	(-3.02)	(-1.75)	(-2.74)	(0.28)	(-0.63)
Controversy	-0.1987**	-0.3044***	0.0289***	0.0138***	0.0396***	0.0154***	0.1012*	0.0042
	(-2.03)	(-3.42)	(3.78)	(4.19)	(3.59)	(3.79)	(1.74)	(0.14)
ESG Score x Controversy	0.0529	0.3676**	-0.0396***	-0.0161***	-0.0446**	-0.0138*	-0.1116	-0.0313
	(0.31)	(2.09)	(-3.01)	(-2.70)	(-2.25)	(-1.85)	(-1.09)	(-0.57)
(*control variables omitted*)								
Firm-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Year-fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Country -fixed effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	12,054	44,460	11,951	45,061	12,033	45,283	11,997	45,214
N. Firms	1,551	5,544	1,532	5,578	1,551	5,624	1,542	5,606
R-squared	0.798	0.763	0.519	0.553	0.730	0.754	0.346	0.294
Adj. R-squared	0.767	0.729	0.444	0.489	0.687	0.718	0.244	0.192

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

APPENDIX A SAMPLE DESRIPTION

Part A - Country Distribution

Country	# of Firms	# of Firm-Year Obs.	% of total firms	% of total Firm-Year obs.	avg Firm-Year Obs
Argentina	32	93	0.45%	0.16%	2.91
Australia	496	3,642	6.91%	6.35%	7.34
Austria	22	250	0.31%	0.44%	11.36
Belgium	35	417	0.49%	0.73%	11.91
Brazil	102	793	1.42%	1.38%	7.77
Canada	401	3,426	5.59%	5.98%	8.54
Chile	41	269	0.57%	0.47%	6.56
China	300	1,352	4.18%	2.36%	4.51
Colombia	23	131	0.32%	0.23%	5.70
Czech Republic	5	47	0.07%	0.08%	9.40
Denmark	31	385	0.43%	0.67%	12.42
Egypt	12	98	0.17%	0.17%	8.17
Finland	31	399	0.43%	0.70%	12.87
France	128	1,475	1.78%	2.57%	11.52
Germany	131	1,265	1.83%	2.21%	9.66
Greece	27	285	0.38%	0.50%	10.56
Hong Kong	215	1,873	3.00%	3.27%	8.71
Hungary	4	41	0.06%	0.07%	10.25
India	110	855	1.53%	1.49%	7.77
Indonesia	40	303	0.56%	0.53%	7.58
Ireland	18	205	0.25%	0.36%	11.39
Italy	76	724	1.06%	1.26%	9.53
Japan	467	5,900	6.51%	10.29%	12.63
Malaysia	59	476	0.82%	0.83%	8.07
Mexico	46	314	0.64%	0.55%	6.83
Netherlands	55	551	0.77%	0.96%	10.02
New Zealand	58	320	0.81%	0.56%	5.52
Norway	33	362	0.46%	0.63%	10.97
Pakistan	5	10	0.07%	0.02%	2.00
Peru	29	97	0.40%	0.17%	3.34
Philippines	27	217	0.38%	0.38%	8.04
Poland	36	285	0.50%	0.50%	7.92
Portugal	14	161	0.20%	0.28%	11.50
Qatar	14	80	0.20%	0.14%	5.71
Russian Federation	38	362	0.53%	0.63%	9.53
Saudi Arabia	15	99	0.21%	0.17%	6.60
Singapore	56	665	0.78%	1.16%	11.88
South Africa	143	1,059	1.99%	1.85%	7.41
South Korea	135	1,035	1.88%	1.81%	7.67
Spain	64	681	0.89%	1.19%	10.64
Sweden	80	850	1.11%	1.48%	10.63
Switzerland	82	902	1.14%	1.57%	11.00
Thailand	41	299	0.57%	0.52%	7.29
Turkey	31	262	0.43%	0.46%	8.45
United Arab Emirates	16	79	0.22%	0.14%	4.94
United Kingdom	475	4,880	6.62%	8.51%	10.27
United States	2,876	19,042	40.08%	33.22%	6.62
Total	7,175	57,316	100%	100%	7.99

Part B - Region Distribution

Region	# of Firms	# of Firm-Year Obs.	% of total firms	% of total Firm-Year obs.	avg Firm-Year Obs
Africa	143	1,059	1.99%	1.85%	7.41
Asia-Pacific	2,009	16,947	28.00%	29.57%	8.44
Central/South America	273	1,697	3.80%	2.96%	6.22
Europe	1,385	14,527	19.30%	25.35%	10.49
Middle East	88	618	1.23%	1.08%	7.02
North America	3,277	22,468	45.67%	39.20%	6.86
Developed	*5,871*	*48,660*	*81.83%*	*84.90%*	*8.29*
Emerging	*1,304*	*8,656*	*18.17%*	*15.10%*	*6.64*
Total	7,175	57,316	100%	100%	7.99

Part C - Industry Distribution

Industry	# of Firms	# of Firm-Year Obs.	% of total firms	% of total Firm-Year obs.	avg Firm-Year Obs
Basic Materials	696	6,083	9.70%	10.61%	8.74
Consumer Cyclicals	992	8,457	13.83%	14.76%	8.53
Consumer Non-Cyclicals	469	4,037	6.54%	7.04%	8.61
Energy	507	4,196	7.07%	7.32%	8.28
Financials	1,551	12,033	21.62%	20.99%	7.76
Healthcare	635	3,919	8.85%	6.84%	6.17
Industrials	1,057	9,139	14.73%	15.94%	8.65
Other	134	560	1.87%	0.98%	4.18
Technology	670	4,763	9.34%	8.31%	7.11
Telecommunication Services	170	1,509	2.37%	2.63%	8.88
Utilities	294	2,620	4.10%	4.57%	8.91
Total	7,175	5,7316	100%	100%	7.99

Part D - Year Distribution

Year	# of Firm-Year Obs.	% of total Firm-Year obs.
2002	851	1.48%
2003	867	1.51%
2004	1,615	2.82%
2005	2,026	3.53%
2006	2,065	3.60%
2007	2,247	3.92%
2008	2,703	4.72%
2009	3,104	5.42%
2010	3,604	6.29%
2011	3,733	6.51%
2012	3,832	6.69%
2013	3,942	6.88%
2014	4,066	7.09%
2015	4,846	8.45%
2016	5,713	9.97%
2017	6,240	10.89%
2018	5,862	10.23%
Total	57,316	100%

APPENDIX B CONTROVERSIES DISTRIBUTION

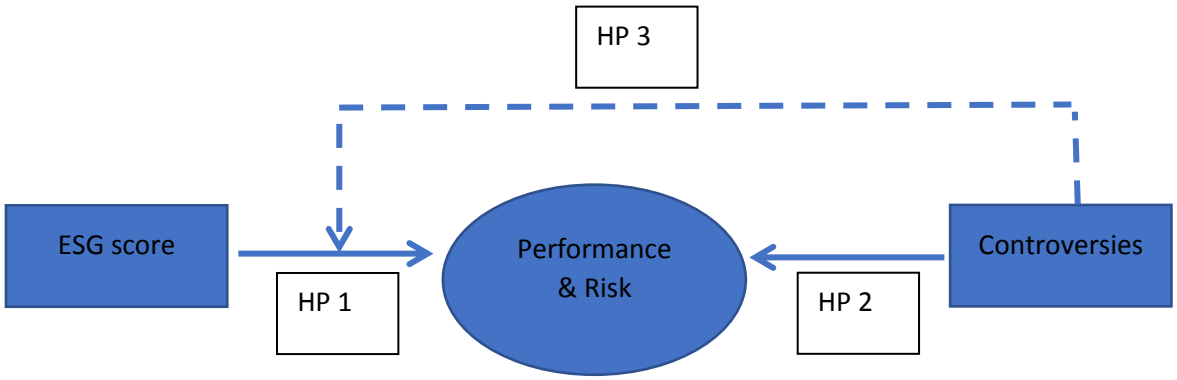
Part A - Controversy types by region distribution

	Number of controversies			
Region	**Environment**	**Social**	**Governance**	**Total**
Africa	4	310	10	324
Asia-Pacific	104	4,043	239	4,386
Central/South America	39	393	42	474
Europe	239	7,837	514	8,590
Middle East	1	79	4	84
North America	299	12,757	1,038	14,094
Developed	*587*	*23,010*	*1,713*	25,310
Emerging	*99*	*2,409*	*134*	2,642
Total	686	25,419	1,847	27,952

Part B - Controversy types by industry distribution

	Number of controversies			
Industry	**Environment**	**Social**	**Governance**	**Total**
Basic Materials	166	1,885	106	2,157
Consumer Cyclicals	107	3,925	236	4,268
Consumer Non-Cyclicals	17	2,289	116	2,422
Energy	261	1,753	151	2,165
Financials	5	4,723	497	5,225
Healthcare	13	2,386	172	2,571
Industrials	31	3,274	209	3,514
Other	0	155	24	179
Technology	1	3,076	231	3,308
Telecommunication	0	1,176	59	1,235
Utilities	85	777	46	908
Total	686	25,419	1,847	27,952

FIGURE 1 - CONCEPTUAL FRAMEWORK - OVERALL



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