

## Impact of Environmental, Social and Governance Practices on Firm Financial Risk in Emerging Countries

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### Abstract

The study's main purpose is to investigate the relationship between environmental, social and governance (ESG) practices and firm financial risk. The study used the data of 1042 companies of 26 emerging countries for the period of 2010 to 2019. The secondary data retrieved from Refinitiv Eikon database was used to analyze the association between ESG practices and firm financial risk by employing the Feasible Generalized Least Square (FGLS) models. In this study the aggregate ESG scores as well as pillar-wise environmental, social and governance scores were used. Moreover, three different risk proxies such as systematic, idiosyncratic and total risks were used to measure the firm financial risk. Results showed a significant and negative relationship between aggregate ESG scores and firm systematic risk, idiosyncratic risk and total risk. Similarly, pillar-wise environmental, social and governance scores have also significant and negative impact on firm systematic risk, idiosyncratic risk and total risk. The findings of the current study have provided a framework and guidance to the companies and investors of emerging countries that firm financial risk is an essential determinant of cost of capital which reduces the firm financial risk. Moreover, the firms that are using the ESG practices can reduce their financial risk; which ultimately increases the firm performance/value that would attract more investors to invest in these firms. Besides this the current study has also useful implications for regulators, policy makers, portfolio managers and government agencies in emerging countries.

**Keywords:** ESG Practices, Firm Financial Risk, FGLS Models, Emerging Countries.

Environmental, Social, and Governance (ESG) is a set of criteria that shareholders use to search, filter and consider the socially responsible firms. ESG is best characterized as a framework that describes how the organizations manage their risks and opportunities related to environmental, social and governance issues; and how it helps the stakeholders to understand the organization's commitment to these issues. The ESG activities extended as a long-term initiative due to climate change effects and the COVID-19 pandemic. The Incorporation of ESG activities is crucial in risk approaches and it has now seen as an emerging factor for firm financial growth. The signatories of United Nation Principles for Responsible Investment (UNPRI) accounted more than US\$80 trillion in assets under management worldwide by the end of 2019 (Matos, 2020). Therefore, the consideration of the global investors towards sustainable investing and ESG issues are increased to high level due to rapid increase in the importance and recognition of ESG issues; and it is now become one of the most important issue that got a considerable attention from academicians, researchers and policymakers (Almeyda & Darmansya, 2019; Devalle, 2017).

The significance of ESG has motivated several scholars to investigate the ESG with different aspects; such as ESG and corporate financial performance (Naeem, Ullah & Jan 2021; Bernardi & Stark, 2018; Cek & Eyupoglu, 2020; Revelli & Viviani, 2015; Shakil, Mahmood, Tasnia & Munim, 2019; Di Tommaso & Thornton, 2020), ESG and cost of capital of firms (El Ghouli, Guedhami, Kwok & Mishra, 2011; Dhaliwal et al., 2011; Di Giulio et al., 2007; Reverte, 2012), ESG and shareholder value (Du et al., 2010; Barnea & Rubin, 2010; Godfrey, Merrill & Hansen, 2009), ESG and cost of equity of firms (Girerd-Potin, Jimenez-Garcès, & Louvet, 2014), ESG and firm value (Lo & Sheu, 2007), ESG and stakeholders' trust (Antonia et al., 2013), ESG and consumer behavior towards firms strategies (Marin et al., 2009; Pivato et al., 2008) and ESG and cost of borrowing of firms (Goss & Roberts, 2011) etc.

Besides the huge body of literature that examine the ESG with different aspects; only few studies so far addressed the relationship between ESG practices and firm financial risk both theoretically and empirically. Theoretically, some studies justified that ESG practices have reduced the firm risk such as firm greater in reputation (Godfrey et al., 2009), less in information asymmetry (Lahrech, 2011) and better in balancing the stakeholders interests (Mishra & Modi, 2013). Empirically, several studies also investigate the impact of ESG on firm financial risk and reported

positive, negative and insignificant results. Some of these studies found negative (Orlitzky & Benjamin, 2001; Salama, Anderson & Toms, 2011; Sharfman & Fernando, 2008), while other concluded a positive association between ESG and firm financial risk (Bouslah, Kryzanowski & M'Zali, 2016). In spite of the significant importance of ESG practices and firm financial risk over time, most of these studies were focused only on developed countries and the data used in these studies were generally outdated and lacks comparability (Bernardi & Stark, 2018; Shakil et al., 2019; Di Tommaso & Thornton, 2020). Besides this, there are limited studies so far found in the wider context of emerging countries that concentrated on the relationship between ESG practices and firm financial risk. Therefore, there is dearth of research on ESG practices and firm financial risk in emerging markets and these inconclusive results further motivated this study to examine that how various types of risks (i.e. systematic, idiosyncratic and total risks) are associated with ESG practices in emerging countries (Muhammad et al., 2015; Jo & Harjoto, 2014; Shakil, 2020). Thus, the study's main objective is to investigate the relationship between ESG practices and firm systematic, idiosyncratic and total risks in emerging countries for the period of 2010 to 2019.

The current study contributes towards the sustainability literature on ESG practices and firm financial risk in emerging countries both theoretically and empirically. Theoretically, the study first supports the assumptions of stakeholder theory; which predicted a negative relationship between ESG practices and firm financial risk. By meeting the needs of different stakeholders, the ESG practices leads to increase the firm value and also reduces the firm financial risk (Chakraborty et al., 2019; Shakil, 2020; Lueg et al., 2019; Shakil et al., 2020). Moreover, the potential of high ESG scores build up moral capital, which encouraged and motivate the firm stakeholders to become more loyal to these firms (Godfrey, 2005). As a result the reaction of these loyal stakeholders are less persuaded to sensitive and negative news and information's; which also reduces the firm financial risk, volatility and also lower the market risk of these companies (Godfrey, 2005). Similarly, the current study also supports the risk management theory, which states that the firms are protected during the unfavorable market situation by effective and better ESG performance (Benlemlih & Girerd-Potin, 2017; Sharfman & Fernando, 2008). Thus, it reduces the firm volatility and market risk of respective company. The study also extended the modern portfolio theory, that the investors are able to diversify their idiosyncratic and total risk by effective portfolio management and they are compensated only for bearing systematic risk (Chakraborty et al., 2019; Benlemlih & Girerd-Potin, 2017). Furthermore, investing in firms with high ESG scores might contribute to lower idiosyncratic and total risk in portfolio, that implies the utility function of utility theory; that investing in these firms are attractive both for risk-prone and risk-averse investors.

Empirically, the current study also contributes to existing literature in different means. Firstly, most of the previous studies observed the association between ESG practices and firm performance in developed countries with inconclusive results (Bernardi & Stark, 2018; Cek & Eyupoglu, 2020; Shakil et al., 2019). However, the current study examined the relationship between ESG practices and firm financial risk in emerging countries as a neglected area of research. Moreover, the study also investigated the effect of each pillar, i.e., environmental pillar, social pillar and governance pillar as well as aggregate ESG scores, which were also rarely being considered in previous studies (Aouadi & Marsat, 2018; Abound & Diab, 2018; Fatemi et al., 2017; Baldini et al., 2016; Nekhili et al., 2017). Secondly, previous studies were narrowly focused on single industry, region and even a single country; where the findings of these studies lack generalizability (Atan, Alam, Said & Zamri, 2018; Balatbat, Siew & Carmichael, 2012; Huang, 2021; Ruan & Liu, 2021). However, the current study used multi-industries and multi-countries data of emerging markets that could provide more generalizable findings. Thirdly, previous studies mostly used single risk measure to determine the relationship between ESG practices and firm financial risk. Thus, in order to provide the more robust results and to capture the effect of all the risk measures; this study used different risk measures; such as systematic, idiosyncratic and total risks to explore the relationship between ESG practices and firm financial risk in emerging countries. Hence, in order to address the research problem and to fill the research gap, the current study has proposed the following research questions and objectives.

**Research Question 1:** Is there any relationship between aggregate ESG and firm financial risk (i.e. systematic, idiosyncratic and total risks) in emerging countries?

**Research Question 2:** Is there any relationship between environmental, social and governance pillars and firm financial risk (i.e. systematic, idiosyncratic and total risks) in emerging countries?

**Research Objective 1:** To find out the impact of aggregate ESG on firm financial risk (i.e. systematic, idiosyncratic and total risks) in emerging countries.

**Research Objective 2:** To find out the impact of environmental, social and governance pillars on firm financial risk (i.e. systematic, idiosyncratic and total risks) in emerging countries.

### ***Theoretical Background of ESG and Firm Financial Risk***

The association between ESG practices and firm financial risk are justified by several arguments theoretically. One argument based on stakeholder theory, defined that the firms that are high in ESG activities are associated with low financial risk. Thus, as a result these firms can increase more steady relations with government, financial community and other stakeholders. On the other hand the companies which are low in ESG practices are associated with higher financial risk and higher legal fines and law suits (McGuire et al., 1988). The investors are willing to invest more in companies that are higher in ESG practices; thus, the capital constraints for these companies are lower in capital markets (Cheng et al., 2014). Similarly, the company reputation can also be enhanced by better ESG practices (Cornell & Shapiro, 1987); it can increase the brand value and also improve the product brand image (Brown & Dacin, 1997). It can further help the management to attract and retain the workforce of the firm (Greening & Turban, 2000; Turban & Greening, 1997).

The risk management theory also suggested that better ESG practices lead to positive moral capital between several stakeholders which can also provide “insurance-like” protection to firms even in the time of crises (Godfrey, 2005). Moreover, the moral capital encouraged by ESG activities leads to positive attributions of stakeholders; which increases their loyalty towards company (Luo & Bhattachary, 2009). Further, Godfrey et al. (2009) used this theory empirically and found that the firms that are engaged in high ESG practices are less risky in negative events and provide more value to shareholders. Chakraborty et al. (2019) and Benlemlih and Girerd-Potin (2017) also support the risk management theory; and concluded that ESG practices has significantly reducing the firm financial risk.

Conversely, the managerial opportunism theory suggested that there is a positive association between ESG and firm financial risk (Bouslah, Kryzanowski & M'Zali, 2013). This theory suggested that the management predominantly pursue their private interest (Preston & O'Bannon, 1997). Therefore, they focused only on short-term profit objectives. Mostly they invest less in ESG activities when corporate financial performance (CFP) is high in order to cash in and ignoring the risks that occurs in the long run. However, when firm CFP is low than managers are investing more in ESG activities in order to justify their results. Typically, the managers are utilizing their investments in ESG in pursuit of their private goals (Cespa & Cestone, 2007).

### ***Aggregate ESG and Firm Financial Risk***

Several studies used aggregate ESG scores to analyze the relationship between ESG practices and firm financial risk. Such as Lueg et al. (2019) Sassen, Hinze and Hardeck (2016) and Shakil (2020) used aggregate ESG scores and found that ESG has significant and important role in decreasing the stock market volatility and firm risk. Similarly, Jo and Na (2012) used the data of US controversial industries and found that the firms with overall ESG engagement alleviate sensitivities to market fluctuations and also its systematic risk. Likewise, Luo and Bhattacharya (2009) used a sample of Fortunes MAC firms and found a negative association between aggregate ESG and firm systematic risk. Oikonomou et al. (2012) employed the data of KLD database on S&P-500 sample firms and found a significant negative relationship between individual strength components of KLD and firm systematic risk. Some other studies also confirm that ESG has negative impact on firm idiosyncratic risk; and it can be assumed by employee loyalty, strong customer trust and positive reputation (Boutin et al., 2004; Bouslah, Kryzanowski & M'Zali, 2013; Lee & Faff, 2009; Mishra & Modi, 2013).

More recent, Shakil (2021) used the international sample of 70 oil and gas firms for the period of 2010-2018 and found a significant negative relationship between aggregate ESG performance and firm total risk. Moreover, Reber, Gold and Gold (2022) analyze the effect of ESG voluntary disclosure and ESG scores in initial public offerings at the time of listing on idiosyncratic risk and found a significant negative association between ESG and firm idiosyncratic risk. Similarly, Giese, Nagy and Lee (2021) also showed that aggregate ESG added value in terms of firm performance by reducing the firm risk. Finally, Izcan and Bektas (2022) used the data of Eurozone banks and found a significant negative relationship between aggregate ESG scores and idiosyncratic risk of banks for medium to high levels of risk. The above discussion suggested that there is a significant negative relationship between aggregate ESG scores and firm financial risk. Hence, the study concludes the following hypothesis.

*H<sub>1</sub>: There is a significant negative relationship between aggregate ESG and firm financial risk.*

### **The Environmental Pillar and Firm Financial Risk**

It is suggested by the previous studies that firms that are strong in environmental performance found to be less risky as compared to those which are low in environmental performance (Spicer, 1978; Shane & Spicer, 1983). The firms that are environmentally responsible can also help to reduce the environmental disruptions (King, 1995). Moreover, the companies that are committed to environmental issues, implementing effective measures and also give information to general public about their achievements can also reduce the firm risk (Feldman et al., 1997; Sharfman & Fernando, 2008). Similarly, Orlitzky and Benjamin (2001) used the data of US firms and concluded that besides the other dimension of ESG, the environmental pillar has negative but weak relationship with firm risk. Furthermore, Salama et al. (2011) found that there is a negative relationship between firm environmental issues and systematic risk in UK firms. Similarly, the firm social and environmental responsibility reduces the information asymmetry and firm stock price volatility in the market (Jia et al., 2020; Lueg et al., 2019; Shakil, 2020). More recent, Izcan and Bektas (2022) found a significant negative relationship between idiosyncratic risk and environmental pillar of banks for medium to high levels of risk. Similarly, Giese, Nagy and Lee (2021) found that environmental pillar has developed slow but long-lasting financial effects and also reducing the erosion risks. Thus, it is concluded that environmental commitments need expensive and long term investments for the treatment of emissions, remediation costs and waste disposal etc. Therefore, it is also assumed that the effective firm financial performance and low financial risk are especially needed to fund these investments. Hence, the following hypothesis is derived from the above discussion.

*H<sub>2</sub>: There is a significant negative relationship between environmental pillar and firm financial risk.*

### **The Social Pillar and Firm Financial Risk**

Another important dimension of ESG is social issues; it is expected that social issues have strong causal relationship with firm financial risk and thus it is considered that firm social issues are the integral part of firm and public relationship (Orlitzky & Benjamin, 2001). Several empirical studies concluded that firm financial risk can be reduced by strong social performance. Such as Chollet and Sandwidi (2018) highlighted that there is a significant and negative relationship between CSP and firm financial risk. Similarly, Sassen et al. (2016) concluded that a negative association between social performance and firm financial risk. Moreover, Verwijmeren and Derwall (2010) highlighted that firms which are good in human resource practices reduces their bankruptcy risk. Besides this, Oikonomou, Brooks and Pavelin (2012) concluded that firm social issues have negative impact on firm systematic risk. Moreover, Bouslah et al. (2013) concluded a unidirectional causality between human rights strengths and firm risk; and found bidirectional causality between product strength, employees, community and firm risk. Furthermore, Arntz, Gregory and Zierahn (2016) found a negative association between socially responsible firms and market systematic risk in US firms. Recently, Giese, Nagy and Lee (2021) found that social pillar has developed slow but long-lasting financial effects which also reducing the erosion risks. The above discussion concluded the following hypothesis.

*H<sub>3</sub>: There is a significant negative relationship between social pillar and firm financial risk.*

### **The Governance Pillar and Firm Financial Risk**

Most of the previous studies investigated empirically the relationship between governance pillar and firm financial risk. The results of these studies are inconclusive and concluded that the relationship between governance pillar and firm financial risk are both positive and negative (John, Litov & Yeung, 2008). Such as Bouslah et al. (2013) concluded a positive association between governance pillar and firm financial risk. They further added that there is bidirectional causality between corporate governance and firm risk. Hence, more funds are available to invest in governance pillar and for its improvements such as compensation of board members and policies for shareholder rights through low financial risk and effective financial performance (Bouslah et al., 2013). On the other hand, Izcan and Bektas (2022) used the data of banks and found a significant negative association between governance pillar and idiosyncratic risk for medium to high levels of risk. Similarly, Giese, Nagy and Lee (2021) also found that in short term the governance pillar showed greatest significance because these have tended to materialize as event risks that immediately affect the stock prices. As lack in empirical evidences, governance dimension is considered as more relevant to investors; and thus, still there is a gap found in governance dimension and firm financial risk. Thus, it is expected that the governance pillar has strong risk-reducing effects and it seems to be more relevant for investors. Therefore, based on above discussions, current study derived the following hypothesis.

*H<sub>4</sub>: There is a significant negative relationship between governance pillar and firm financial risk.*

## Research Methodology

The current study used the quantitative research technique to establish the relationship between research variables. Similar like previous studies, this study also used the panel data regression analysis technique to test the association between ESG practices and firm financial risk in emerging countries (Saleh et al., 2011; Jang et al., 2013).

### **Population, Sample and Data Collection**

The population of the study consists of 67122 firms listed on the stock markets of 27 emerging countries. The study exclude the firms with missing and incomplete data; and hence, the final sample of the study consists of 26 emerging countries (i.e. China, India, Indonesia, Korea, Malaysia, Pakistan, Philippines, Thailand, Taiwan, Czech Republic, Greece, Hungary, Poland, Russia, Turkey, Argentina, Brazil, Chile, Colombia, Mexico, Peru, Egypt, Qatar, Saudi Arabia, South Africa and UAE) based on MSCI categorization of emerging countries (MSCI, 2019) with total number of 1042 companies listed on Refinitiv Eikon database for the period of 2010 to 2019 (Refinitiv, 2019). The study used the purposive sampling technique and selects all those companies as sample which are engaged in ESG activities and are also listed on Refinitiv Eikon database (Refinitiv, 2019). The ESG data was collected from Refinitiv ESG index (Garcia, Mendes-Da-Silva & Orsato, 2017; Cheng et al., 2014); while, the data of firm financial risk and control variables were extracted from datastream which are also available on Refinitiv Eikon database.

### **Explanation of Study's Variables**

#### **Dependent Variable: Firm Financial Risk**

Similar like previous studies, this study also used three different financial risk proxies; such as systematic risk, idiosyncratic risk and total risk as dependent variables (Harjoto & Jo, 2015; Cheng, 2008; Oikonomou, Brooks & Pavelin, 2012).

#### **Systematic Risk (BETA)**

Systematic risk is defined as the company's sensitivity of a security compared to the overall market index that will affect the firm's own stock (Bodie et al., 2014; Oikonomou et al., 2012). Previous studies used market beta as a proxy to measure the firm systematic risk (Chollet & Sandwidi, 2018; Benlemlih et al., 2018). The current study used CAPM model to measure the firm systematic risk (Beta) (Salama et al., 2011; Oikonomou, Brooks & Pavelin, 2012). The firm systematic risk is calculated by using the monthly excess returns. The monthly stock prices and country stock market index was used to calculate the firm returns.

#### **Idiosyncratic Risk (IDVOL)**

Idiosyncratic risk is inherent in the operations of firm and its management; and hence, it is considered as the most relevant risk for investors (Hull, 2018). This risk can be mitigated by diversification of the portfolio (Hull, 2018). For the measurement of firm idiosyncratic risk; the current study used the standard deviation of the residuals from CAPM model (Carhart, 1997).

#### **Total Risk (VOL)**

The standard deviation or volatility of the firm return index (RI) is referred to total risk of the firm. The standard deviation of the return from the underlying asset is often used to calculate the volatility of a variable (Hull, 2018). Thus, to calculate the firm total risk, the current study used the annualized standard deviation of monthly stock returns over the past year to measure the firm total risk (Harjoto & Jo, 2015; John, Litov & Yeung, 2008).

#### **Independent Variable: ESG Measures**

The current study used ESG as independent variable. The ESG data was retrieved from Refinitiv Eikon database. Refinitiv Eikon is a highly recognized database in the industry worldwide, and it has more than 600 different ESG metrics, which cover more than 85% of the global market cap (Refinitiv, 2021). Refinitiv Eikon provides the ESG informations in systematic, objective, transparent, comparable and auditable form; which are comprehensively used to assess the corporate performance (Cheng, Ioannou & Serafeim, 2014). More than 150 content research analysts collect the ESG data across the globe; these analysts collect ESG information's from firm websites, firm CSR reports, firm stock exchange filings, firms annual reports, NGO websites and other news sources; and put these information's on Refinitiv ESG index (Refinitiv, 2021). These information's are further divided into ten categories such as resource use, workforce, emission,

innovation, community, human rights, product responsibilities, shareholders, management and CSR strategy (Refinitiv, 2021). These categories are further reformulated into three pillar-wise scores and the aggregate ESG scores, which reflects the company overall ESG performance, effectiveness and commitment based on publicly reported information's (Refinitiv, 2021). Afterward, these three scores are ranked among the companies and obtained either a graded score of D- to A+ and a numerical score from 0 to 100 (Refinitiv, 2021). Several previous researchers extensively used Refinitiv Eikon ESG scores in their studies (Bae et al., 2021; Eccles et al., 2014; Batae et al., 2021; Ioannou & Serafeim, 2012; Shakil et al., 2019).

### Control Variables

Similar like previous studies, this study also used firm size (SIZE), leverage (LEV), dividend yield (DY) and market to book (MTB) as control variables (Chakraborty et al., 2019; Oikonomou et al., 2012; Shakil et al., 2020; Shakil, 2020). The natural log of total assets was used as a proxy to measure the firm size (Orazalin & Mahmood, 2018; Shakil, 2020). Previous studies showed that firms large in size can easily control their risk because of their strong financial and strategic position (Benlemlih & Girerd-Potin, 2017). Thus, the risk level of the firm can be influenced by firm size (Sorescu & Spanjol, 2008). Leverage is calculated by dividing the total debt by total equity. Previous studies showed that leverage is directly associated with firm financial risk (Nelson, 1996; Luo & Bhattacharya, 2009). Dividend yield is calculated by dividing the annual dividend per share on market value per share. It is calculated on gross dividends (including tax credits) where available (Refinitiv, 2021). Finally, market to book is defined as the ratio of equity market value to equity book value; it also captures the different characteristics of firm financial risk for firm value and growth (Oikonomou et al., 2012).

### Estimation Techniques

The current study used the following two models to test the study hypotheses. Model-1 was used to test the hypothesis H<sub>1</sub>; and Model-2 was used to test the hypotheses H<sub>2</sub>, H<sub>3</sub> and H<sub>4</sub>.

$$\text{Risk}_{it} = \beta_0 + \beta_1 \text{LESG}_{it} + \beta_2 \text{LEV}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{MTB}_{it} + \beta_5 \text{DY}_{it} + \sum \beta_j \text{Firm}_{it} + \sum \beta_k \text{Industry}_{it} + \sum \beta_l \text{Country}_{it} + \sum \beta_m \text{Year}_{it} + \epsilon_{it} \quad (\text{Model-1})$$

$$\text{Risk}_{it} = \beta_0 + \beta_1 \text{LENV}_{it} + \beta_2 \text{LSOC}_{it} + \beta_3 \text{LGOV}_{it} + \beta_4 \text{LEV}_{it} + \beta_5 \text{SIZE}_{it} + \beta_6 \text{MTB}_{it} + \beta_7 \text{DY}_{it} + \sum \beta_j \text{Firm}_{it} + \sum \beta_k \text{Industry}_{it} + \sum \beta_l \text{Country}_{it} + \sum \beta_m \text{Year}_{it} + \epsilon_{it} \quad (\text{Model-2})$$

Where;

Risk is firm financial risk (proxied by systematic risk, idiosyncratic risk and total risk); LESG is aggregate ESG scores; LENV is environmental pillar; LSOC is social pillar; LGOV is governance pillar; LEV is leverage ratio; SIZE is firm size; DY is dividend yield; MTB is market to book; firm, industry, country and year were used as dummy variables; i is number of firms; t is time period and  $\epsilon$  is error term.

## Analysis and Results

### Descriptive Statistics

Descriptive statistics is used to show the overall summary statistics of all the variables of the study. Table 1 showed the results of descriptive statistics. Results exhibited that the mean value of aggregate ESG scores is 46.37. The standard deviation of aggregate ESG scores is 19.21. Similarly its minimum and maximum values are 1.890 and 100 respectively. Pillar-wise the mean values of environmental, social and governance scores are 42.93, 47.15 and 52.02 respectively. Their standard deviations are 24.67, 24.47 and 22.01. Similarly, their minimum values are 1.000, 1.110 and 1.230 and their maximum values are 98.33, 97.50 and 98.34 respectively. The descriptive statistics of all the independent variables after taking their natural log are also given. Results highlighted that mean value of aggregate ESG score (LESG) is 1.618; its standard deviation is 0.223. The minimum and maximum values of LESG are 0.276 and 2.000 respectively. The mean values of pillar-wise environmental (LENV), social (LSOC) and governance (GOV) scores are 1.516, 1.580 and 1.663. Their standard deviations are 0.380, 0.338 and 0.242 respectively. Moreover, their minimum values are 0.000, 0.045 and 0.090; and maximum values are 1.993, 1.989 and 1.993 respectively.

Results further showed that the mean values of dependent variables such as systematic risk (BETA), idiosyncratic risk (IDVOL) and total risk (VOL) are 0.260, 0.063 and 0.123 respectively. The standard deviations of these variables are 0.975, 0.049 and 0.195 respectively. Similarly, their minimum values are -3.409, 0.011 and 0.005; and their maximum values are 4.375, 0.106 and 1.339 respectively. Finally, descriptive statistics of control variables showed that the mean values of

leverage (LEV), market to book (MTB) firm size (SIZE) and dividend yield (DY), are 0.289, 8.225, 1.916 and 2.837. Their standard deviations are 0.151, 1.128, 2.257 and 2.449 respectively. Their minimum values are 0.005, 6.108, 0.120 and 0.001; and maximum values of these variables are 0.742, 10.95, 14.23 and 12.00 respectively.

**Table 1.**  
*Summary Statistics of all the Variables*

Variable Name	Observations	Mean	Std. Dev.	Minimum	Maximum
Aggregate ESG Scores (ESG)	7599	46.37	19.21	1.890	100
Environmental Pillar (ENV)	7599	42.93	24.67	1.000	98.33
Social Pillar (SOC)	7599	47.15	24.47	1.110	97.50
Governance Pillar (GOV)	7599	52.02	22.01	1.230	98.34
Ln Aggregate ESG (LESG)	7599	1.618	0.223	0.276	2.000
Ln Environmental Pillar (LENV)	7599	1.516	0.380	0.000	1.993
Ln Social Pillar (LSOC)	7599	1.580	0.338	0.045	1.989
Ln Governance Pillar (LGOV)	7599	1.663	0.242	0.090	1.993
Systematic Risk (BETA)	7599	0.260	0.975	-3.409	4.375
Idiosyncratic Risk (IDVOL)	7599	0.063	0.049	0.011	0.106
Total Risk (VOL)	7599	0.123	0.195	0.005	1.339
Leverage (LEV)	7599	0.289	0.151	0.005	0.742
Firm Size (SIZE)	7599	8.225	1.128	6.108	10.95
Market to Book Ratio (MTB)	7599	1.916	2.257	0.120	14.23
Dividend Yield (DY)	7599	2.837	2.449	0.001	12.00

**Source:** Author's Computation

**Notes:** This table shows the descriptive statistics of all the variables used as sample of 26 emerging countries for the period of 2010 to 2019. It shows the number of observations, mean, standard deviation, minimum and maximum values of all the variables.

### Correlation Analysis and Multicollinearity Tests

The current study used the Pearson correlation matrix to test the correlation between dependent, independent and control variables. Moreover, the correlation matrix is also used for the detection of multicollinearity between the variables. Thus, the variables which have more than 90% (i.e. 0.90) correlation values suggested the presence multicollinearity in these variables (Field, 2009). Therefore, to meet the regression assumption and to avoid the multicollinearity problem the variables which have more than 90% or 0.90 values should not be included (Shah & Afridi, 2015). Table 2 presents the results of Pearson correlation analysis. Results showed that all the variables have less than 0.90 correlation values (Field, 2009). Moreover, results showed that the aggregate ESG scores (LESG) has the highest correlation value (i.e. 0.85) which is also still below the threshold value (Field, 2009). Therefore, the results of correlation analysis concluded that there is no multicollinearity problem.

**Table 2.**  
*Pearson Correlation Matrix*

Variable	VOL	BETA	IDVOL	LENV	LSOC	LGOV	LESG	LEV	SIZE	MTB	DY
VOL	1.00										
BETA	-0.09	1.00									
IDVOL	-0.10	-0.63	1.00								
LENV	-0.05	-0.08	0.04	1.00							
LSOC	-0.01	-0.05	0.02	0.63	1.00						
LGOV	-0.01	-0.01	-0.06	0.32	0.37	1.00					
LESG	-0.05	-0.04	-0.34	0.78	0.85	0.63	1.00				
LEV	-0.09	-0.03	-0.61	0.01	-0.01	0.03	0.01	1.00			
SIZE	-0.07	-0.03	0.17	0.15	0.11	0.03	0.12	-0.03	1.00		
MTB	0.01	0.08	0.06	-0.03	0.04	0.00	0.01	-0.12	-0.17	1.00	
DY	0.03	0.07	0.04	0.06	0.07	0.03	0.08	0.01	-0.11	-0.09	1.00

**Source:** Author's Analysis

**Notes:** This table shows Pearson's Correlation Matrix. The matrix shows the correlation between dependent, independent and controlled variables. The correlation matrix is also used to detect the presence of multicollinearity among the variables. The variable which has a value more than 0.90 indicates the presence of multicollinearity.

Besides the results of correlation matrix for multicollinearity; the current study also used the formal method i.e. Variance Inflation Factor (VIF) test for the detection of multicollinearity in variables (Hair et al., 2010). The VIF values more than five identify that there is a problem of multicollinearity in variables (Akinwande et al., 2015). Results of VIF test are given in Table 3. Results revealed that the values of all the variables are less than five; which also confirmed that there is no problem of multicollinearity (Hair et al., 2010).

**Table 3.**

*Variance Inflation Factor Tests*

Aggregate ESG Scores		Social Pillar		Governance Pillar		Environmental Pillar	
Variables	VIF	Variables	VIF	Variables	VIF	Variables	VIF
LESG	1.030	LSOC	1.029	LGOV	1.020	LENV	1.039
SIZE	1.053	SIZE	1.051	SIZE	1.035	SIZE	1.064
LEV	1.075	LEV	1.075	LEV	1.076	LEV	1.075
DY	1.029	DY	1.028	DY	1.006	DY	1.026
MTB	1.790	MTB	1.791	MTB	1.780	MTB	1.786
Mean VIF	2.290	Mean VIF	2.290	Mean VIF	2.282	Mean VIF	2.292

**Source:** Author's Analysis

**Notes:** This table shows the results of Variance Inflation Factor test. It is used to identify the multicollinearity problem in predictor variables. The variables which have a value of more than five indicate the presence of multicollinearity.

**Heteroscedasticity and Autocorrelation Tests**

The current study used the Breusch-Pagan or Cook-Weisberg test to detect the presence of heteroscedasticity (Man, 2017). The presence of heteroscedasticity leads to bias standard errors that ultimately misleading the regression results. Table 4 presents the results of heteroscedasticity. Results confirm the presence of heteroscedasticity in all models used for systematic, idiosyncratic and total risks as the null-hypotheses of heteroscedasticity test are accepted for all the variables.

**Table 4.**

*Heteroscedasticity Test for Firm Financial Risk*

Model with Independent Variables	Systematic Risk		Idiosyncratic Risk		Total Risk	
	F-Statistic	P-Values	F-Statistic	P-Values	F-Statistic	P-Value
Aggregate ESG	14.39	0.0001	27.52	0.0000	21.81	0.0000
Environmental Pillar	16.27	0.0001	23.15	0.0000	20.91	0.0000
Social Pillar	15.84	0.0001	23.35	0.0000	21.85	0.0000
Governance Pillar	16.27	0.0001	25.46	0.0000	24.73	0.0000

**Source:** Author's Analysis

**Notes:** This table shows the Breusch Pagan or Cook Weisberg test of heteroscedasticity for all the proxies of firm financial risk. The null hypothesis of the Breusch Pagan or Cook Weisberg test suggested homoscedasticity in data.

The current study used the Wooldridge test to identify the presence of autocorrelation in panel data for all the dependent variables. Table 5 showed the results of autocorrelation test. The null-hypothesis of Wooldridge test identify that there is no first order autocorrelation in variables. Results showed that the null-hypotheses of all the variables are rejected; therefore, there is no serious problem of autocorrelation in all the variables.

**Table 5.**

*Autocorrelation Test for Firm Financial Risk*

Model with Independent Variables	Systematic Risk		Idiosyncratic Risk		Total Risk	
	F-Statistic	P-Values	F-Statistic	P-Values	F-Statistic	P-Values
Aggregate ESG	0.005	0.9459	0.366	0.5601	0.431	0.3139
Environmental Pillar	0.001	0.9704	0.359	0.5639	0.458	0.3215
Social Pillar	0.006	0.9406	0.365	0.5611	0.473	0.3364
Governance Pillar	0.006	0.9391	0.373	0.5566	0.502	0.4105

**Source:** Author's Analysis

**Notes:** This table shows the results of Wooldridge test of autocorrelation for firm financial risk proxies. The null hypothesis of Wooldridge test suggested no first-order autocorrelation.

## Regression Results

### Regression Results of Firm Systematic Risk (BETA)

The Breusch Pagan or Cook Weisberg test confirmed that there is a problem of heteroscedasticity in regression models. Therefore, in order to deal with the problem of heteroscedasticity; the current study used the Feasible Generalized Least Square (FGLS) models for panel data regression analysis. The FGLS model is the most appropriate and robust model when there is a problem of heteroscedasticity. The results of FGLS models are given in Table 6. Results showed that each dimension of ESG, such as environmental pillar (LENV), social pillar (LSOC) and governance pillar (LGOV) have significant and negative impact on firm systematic risk (BETA). Similarly, aggregate ESG score has also showed significant and negative impact on firm systematic risk. These results validated the findings of Sassen et al. (2016) and Shakil et al. (2020). However, these findings are opposite to the results of Huffman (1989). Based on these results it is concluded that the firms which are adopting the ESG practices have low systematic risk and better financial performance. The results of control variables such as leverage (LEV) and market to book ratio (MTB) have significant and positive; while, SIZE has significant and negative impact on firm systematic risk. The study found positive but insignificant association between dividend yield (DY) and firm systematic risk.

**Table 6.**

*Regression Results of FGLS Models for Firm Systematic Risk (BETA)*

Variables	FGLS Models			
	Model-1	Model-2	Model-3	Model-4
Environmental Pillar	-.0698** (.035)			
Social Pillar		-.083** (.041)		
Governance Pillar			-.099** (.046)	
Aggregate ESG				-.096** (.047)
Leverage	.061*** (.006)	.077*** (.006)	.036*** (.006)	.064*** (.006)
Dividend Yield	.003 (.005)	.003 (.005)	.003 (.005)	.003 (.005)
Market to Book Ratio	.034*** (.004)	.039*** (.004)	.035*** (.004)	.034*** (.004)
Firm Size	-.038*** (.012)	-.039*** (.012)	-.038*** (.012)	-.039*** (.012)
Constant	-4.772 (9.176)	-3.317 (9.243)	-3.856 (9.042)	-3.416 (9.232)
Firm Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes
Year Dummy	No	No	No	No
Observations	7559	7559	7559	7559

**Source:** Author's Analysis

**Notes:** This table shows the regression results obtained by using the FGLS models to determine the relationship between ESG practices and firm systematic risk (BETA) in 26 emerging countries. Separate regression models were used to analyze the aggregate ESG scores and pillar-wise Environmental, Social and Governance scores. Firm, Industry, Country and Year were used as dummy variables. Table also shows the co-efficient values of all the variables with standard errors in parenthesis. Similarly, \*\*\*, \*\*, and \* represent the significance level at 1%, 5% and 10% respectively.

### Regression Results of Firm Idiosyncratic Risk (IDVOL)

Idiosyncratic risk is used as second proxy to determine the relationship between ESG practices and firm financial risk. Table 7 showed the results of ESG and firm idiosyncratic risk. The regression results of FGLS models showed that the environmental pillar (LENV) has significant and negative impact on firm idiosyncratic risk. Similarly, social pillar (LSOC) has also significant and

negative impact on firm idiosyncratic risk. The studies of Benlemlih et al. (2018) and Sassen et al. (2016) also found the same results. Similarly, the relationship between governance pillar (LGOV) and idiosyncratic risk is also significant and negative. Finally, results also highlighted a significant and negative association between aggregate ESG scores and firm idiosyncratic risk. The results of control variables such as leverage (LEV), market to book (MTB) and firm size (SIZE) showed significant and negative; while dividend yield (DY) showed significant and positive impact on firm idiosyncratic risk.

**Table 7.**  
*Regression Results of FGLS Models for Firm Idiosyncratic Risk (IDVOL)*

Variables	FGLS Models			
	Model-1	Model-2	Model-3	Model-4
Environmental Pillar	-0.068*** (0.022)			
Social Pillar		-.363*** (.032)		
Governance Pillar			-1.265*** (.036)	
Aggregate ESG				-.083** (.041)
Leverage	-1.915*** (.043)	-1.894*** (.043)	-2.274*** (.043)	-2.017*** (.043)
Dividend Yield	.19*** (.005)	.18*** (.005)	.156*** (.005)	.177*** (.005)
Market to Book Ratio	-.128*** (.004)	-.126*** (.004)	-.124*** (.005)	-.127*** (.004)
Firm Size	-2.531*** (.01)	-2.533*** (.01)	-2.534*** (.009)	-2.523*** (.01)
Constant	29.141*** (.072)	29.857*** (.077)	27.501*** (.097)	29.165*** (.08)
Firm Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes
Year Dummy	No	No	No	No
Observations	7550	7550	7550	7550

**Source:** Author's Analysis

**Notes:** This table shows the regression results obtained by using the FGLS models to determine the relationship between ESG practices and firm idiosyncratic risk (IDVOL) in 26 emerging countries. Separate regression models were used to analyze the aggregate ESG scores and pillar-wise Environmental, Social and Governance scores. Firm, Industry, Country and Year were used as dummy variables. Table also shows the co-efficient values of all the variables with standard errors in parenthesis. Similarly, \*\*\*, \*\*, and \* represent the significance level at 1%, 5% and 10% respectively.

#### **Regression Results of Firm Total Risk (VOL)**

The firm total risk (VOL) has used as third proxy to determine the relationship between ESG practices and firm financial risk in emerging countries. The regression results of FGLS models for total risk are given in Table 8. Results of FGLS models for firm total risk showed that there is a significant and negative association between environmental pillar (LENV) and firm total risk. The results of current study are similar to the findings of Sassen et al. (2016). Similarly, social pillar (LSOC) has also a significant and negative impact on firm total risk. Lueg et al. (2019) and Sassen et al. (2016) also found a significant and negative association between ESG and total risk. Furthermore, results concluded a significant and negative relationship between governance pillar (LGOV) and firm total risk. The findings of current study in respect of governance pillar are also consistent to Sassen et al. (2016). At last, the aggregate ESG score has also significant and negative impact on firm total risk. Similar results were also found by Sassen et al. (2016), Chang et al. (2014) and Orlitzky and Benjamin (2001). Similarly, firm leverage (LEV) and market to book ratio (MTB) have significant and positive impact on firm total risk. However, the relationship between firm size (SIZE) and firm total risk is significant and negative. The study found no significant association between dividend yield (DY) and firm total risk.

**Table 8.***Regression Results of FGLS Models for Firm Total Risk (VOL)*

Variables	FGLS Models			
	Model-1	Model-2	Model-3	Model-4
Environmental Pillar	-.007** (0.000)			
Social Pillar		-0.004*** (0.000)		
Governance Pillar			-0.002*** (0.000)	
Aggregate ESG				-0.008*** (0.001)
Leverage	.091*** (.006)	.087*** (.006)	.076*** (.005)	.074*** (.004)
Firm Size	-.014*** (.001)	-.013*** (.002)	-.015*** (.001)	-.011*** (.002)
Dividend Yield	.004 (.004)	.005 (.004)	.009 (.006)	.004 (.003)
Market to Book Ratio	.024*** (.002)	.029*** (.002)	.025*** (.002)	.034*** (.002)
Constant	.23*** (.041)	.224*** (.042)	.213*** (.045)	.218*** (.035)
Firm Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Country Dummy	Yes	Yes	Yes	Yes
Year Dummy	No	No	No	No
Observations	7559	7559	7559	7559

**Source:** Author's Analysis

**Notes:** This table shows the regression results obtained by using the FGLS models to determine the relationship between ESG practices and firm total risk (VOL) in 26 emerging countries. Separate regression models were used to analyze the aggregate ESG scores and pillar-wise Environmental, Social and Governance scores. Firm, Industry, Country and Year were used as dummy variables. Table also shows the co-efficient values of all the variables with standard errors in parenthesis. Similarly, \*\*\*, \*\*, and \* represent the significance level at 1%, 5% and 10% respectively.

## Discussions

The regression results of current study concluded a significant and negative relationship between ESG practices and firm financial risk in emerging countries. Firstly, the study showed a significant and negative relationship between aggregate ESG scores and firm systematic risk. Therefore, the hypothesis of the study is accepted at 5% level of significance. Results also concluded a significant and negative relationship between environmental pillar and firm systematic risk. Hence, the hypothesis of the study is also accepted empirically at 5% level of significance. The findings of the current study contradict the results found by Sassen et al. (2016). Similarly, the social pillar has also significant and negative impact on firm systematic risk; thus, the hypothesis of the study is also accepted at 5% level of significance. Previous results showed that firms with high systematic risk use social certification to reduce their exposure risk, which ultimately reduces the firm's systematic risk. The study supports the information asymmetry theory; that firms can reduce the exposure risk by adopting the social activities which can also reduce the firm cost of capital and information asymmetries. The relationship between governance pillar and firm systematic risk is also significant and negative. Thus, the hypothesis of governance pillar is also accepted empirically at 5% significance level. The capital market perceives those firms that are good in governance practices as these firms have higher firm value with low level of risk. The results are consistent to Alam and Shah (2013), Lameira et al. (2011) and Wolfswinkel (2013).

The relationship between ESG practices and firm idiosyncratic risk were also significant and negative. Results showed a significant and negative association between aggregate ESG scores and firm idiosyncratic risk. Thus, the study hypothesis is accepted at 5% significance level. These results are similar to previous results found by Bouslah et al. (2013) and Sassen et al. (2016). Therefore, it means that overall firms with higher ESG scores should have lower idiosyncratic risk. Results further showed a significant and negative relationship between environmental pillar and

firm idiosyncratic risk. Hence, the study hypothesis is also accepted based on 1% significance level. These results are opposite to the findings of Sassen et al. (2016). Moreover, results also indicate a significant and negative relationship between social pillar and firm idiosyncratic risk; hence, it also supports to accept the study hypothesis. These findings are also opposite to results of Sassen et al. (2016). Thus, the firms which are doing more social activities have low idiosyncratic risk; and hence, these firms get significant importance from society, the general community and shareholders; which also increasing the positive response of investors'. Finally, results concluded that there is a significant and negative relationship between the governance pillar and firm idiosyncratic risk. So, it signifies to accept the study hypothesis at 1% significance level. The results are similar to Ferreira and Laux (2007) and Sassen et al. (2016).

At last, the results showed a significant and negative relationship between aggregate ESG and firm total risk. Therefore, the study hypothesis is accepted based on 1% significance level. The higher ESG practices would affect the costs or benefits of the firm that would lower the firm's total risk; hence, investing in ESG rated firms in emerging countries are mostly associated with low volatility. Attig et al. (2013) and Humphrey et al. (2012) also found the same results. Moreover, social pillar has also significant and negative impact on firm total risk. Hence, the hypothesis is accepted empirically at 5% significance level. The social issues are mostly related to external stakeholders (i.e. customers, community etc.) and seem to be the most relevant factors regarding firm risk. Thus, the social activities have significant impact on firm risk due to high public visibility and its accompanying potential to affect the corporate reputation. These results are also similar to Sassen et al. (2016). Finally, results concluded a significant and negative relationship between governance pillar and firm total risk. Thus, the hypothesis of the study is also accepted empirically at 1% significance level. Same results were also found by Sassen et al. (2016). So, the firms that are engaged in governance practices can lower their total risk; while, the firms that are suffering from high financial risk might be under pressure from the stakeholders to improve their governance practices (Bouslah et al., 2013).

### **Conclusion**

The main objective of this study is to investigate the relationship between ESG practices and firm financial risk in emerging countries for the period of 2010 to 2019. The study used three different risk proxies' i.e. systematic, idiosyncratic and total risks. Similarly, study also used aggregate ESG scores as well as pillar-wise environmental scores, social scores and governance scores to determine the impact of ESG practices on firm financial risk in emerging countries.

The results of first proxy i.e. firm systematic risk showed a significant and negative relationship between aggregate ESG scores and firm systematic risk. Similarly, results also confirmed that pillar-wise environmental, social and governance scores also have significant and negative impact on firm systematic risk. Moreover, the results of control variables such as leverage and market to book ratio have significant and positive; while, firm size has significant and negative impact on firm systematic risk. Results of second proxy; i.e. idiosyncratic risk, showed that aggregate ESG scores as well as environmental pillar, social pillar and governance pillar also have significant and negative impact on firm idiosyncratic risk. Similarly, the results of control variables for firm idiosyncratic risk; such as leverage, market to book ratio and size have significant and negative; while, dividend yield has significant and positive impact on firm idiosyncratic risk. The results of third proxy i.e. total risk; also highlighted a significant and negative relationship between pillar-wise environmental, social and governance as well as aggregate ESG scores and firm total risk. Furthermore, the results of control variables for firm total risk; such as leverage, dividend yield and market to book have significant and positive and size has significant and negative impact on firm total risk.

The study found significant evidence that ESG practices have significant and negative impact on firm financial risk. Thus, firms which are high in ESG scores are less risky; and hence, these firms can also reduce their discount rate which ultimately increases the firm value of these firms (Derwall, 2007). From the perspective of investors, the current study suggested that the firms which integrate the ESG activities in their overall strategies and operations can reduce the financial risk (Orlitzky & Benjamin, 2001; Harjoto & Jo, 2015). The firms that are doing ESG practices and providing ESG information's to investors/potential investors can reduce the cost of capital of the firm (Dhaliwal et al. 2011). Thus, to provide the relevant information's about the ESG issues to investors, the national and international level policymakers should need to increase the ESG practices regulations (e.g. through mandatory ESG disclosure) in emerging countries. These mandatory ESG practices would also encourage the firms to integrate the ESG factors in their strategies and operations that would also help in reducing the firm financial risk; and thus, stabilize the capital markets in emerging countries. Moreover, the pressures from stakeholders, regulatory

authorities and the reputational environmental risks also encourage the firms to integrate the ESG activities in their strategies.

### **Limitations and Future Directions**

First, the current study used only emerging countries data; in future studies, the same research should also be conducted in other geographical areas and especially in developed countries. Moreover, the comparison between developed and emerging countries would also be an interesting area for future research. Second, the current study was based only on secondary data; in future, the mixed methods (i.e. quantitative and qualitative) should also be used. Similarly, the use of some primary sources, such as questionnaires and interviews etc. would also provide more robust results in future studies. Third, the current study used ESG measures based on Refinitiv Eikon database; the results of the current study would further be triangulated by using the data of several other databases (i.e. KLD, Bloomberg, EURO STOXX Sustainability Index, MSCI, Vigeo rating agency, Dow Jones etc.) that have different method of computing ESG indexes. Therefore, it might provide more robustness to the results of current study.

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