The Impact of ESG Practices on Firm Performance: Evidence From Emerging Countries

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Abstract: Shareholders, investors, creditors, government and other environmental agencies have also considered ESG as an important element towards sustainable development. Thus, the purpose of the current study is to analyze the impact of ESG practices on firm performance of the financial and non-financial companies of emerging countries. The study has used the data of 1042 companies of all the emerging countries for the period of 2010 to 2019. The data has been extracted from Thomson Reuters Asset4 ESG index and DataStream. The panel data regression analysis technique such that fixed effects model, random effects model and FGLS has been used. Based on Tobin's Q results it is concluded that ENV, SOC and GOV scores individually and aggregate ESG score have significant positive impact on firm value. Similarly, the results of ROA have also highlighted that the individual component of ESG (i.e. ENV, SOC and GOV) and combined score of ESG have significant positive impact on firm profitability. The current study has analyzed empirically the impact of ESG on firm performance in emerging countries worldwide. Therefore, it will have useful implications for investors, policy makers, regulators, socially responsible analysts, government agencies and other related agencies in emerging countries. To the best of author's knowledge this is almost the first empirical study which has used such a large number of emerging countries worldwide and their data to determine the impact of ESG practices on firm performance. Moreover, while previous studies used only single dimension of ESG or only aggregate ESG score; while this study has also used both the pillar wise and aggregate ESG scores to determine firm performance. Moreover, this study has also used different measures of firm performance such as firm value (Tobin's Q) and firm profitability (ROA) to find out the impact of ESG on firm performance in emerging countries.

Keywords: ESG Practices, Profitability, Firm Performance, Panel data, Emerging Countries.

1. Introduction

Environmental, social and governance (ESG) has become one of the hottestissues and get a significant importance in recent years; therefore, it has become the focus of everyone because of sustainable development and pursuing high-quality growth (Almeyda&Darmansya, 2019; Devalle, 2017). The interests of shareholders, regulatory authorities, investors, creditors and government agencies are increasing day by day in ESG issues (Hill, Ainscough, Shank &Manullang, 2007; Escrig-Olmedo, Muñoz-Torres & Fernández-

Izquierdo, 2013). After the pandemic of COVID-19 the importance and recognition of ESG issues has increased rapidly and the attention of global investors towards ESG issues and sustainable investing have also risen to a higher degree. The initiative of United Nation's Principles of Responsible Investment (UNPRI) has increased by 20% in 2018-19 (UNPRI, 2019). Bloomberg has also reported that the Europe alone has committed 12 trillion dollars in sustainable investing. Matos (2020) reported that by the end of 2019 the signatories to the UNPRI accounted for more than 80 trillion dollars in assets under management (AUM) worldwide.

The independent third parties, such as Bloomberg, KLD, Thomson Reuters Asset4, STOXX Global ESG leaders Index, MSCI Global Sustainability Indexes, Dow Jones Sustainability Index, Vigeo rating agency, EURO STOXX Sustainability Index etc. track and rate the annual ESG performance of several firms of developed and emerging countries and make this information available to shareholders, investors and regulators and other agencies. The rapid increase in the demand of ESG disclosure has raises several questions. First, what are the benefits do firms gain by securing the high level of ESG rating? Second, how does the ESG issues are related to the firm financial performance? In order to answer these questions several studies investigated the ESG with different aspects; such as ESG and cost of capital (Dhaliwal *etal.*, 2011; Di Giulio*et al.*, 2007; El Ghoul, Guedhami, Kwok & Mishra, 2011; Reverte, 2012), shareholder value and ESG (Barnea& Rubin, 2010; Du *et al.*, 2010; Godfrey *et al.*, 2009), ESG and cost of equity (Girerd-Potin*et al.*, 2014), stakeholders' trust and ESG (Antonia *et al.*, 2013), consumer behavior and ESG (Marin *et al.*, 2009; Pivato*et al.*, 2008), ESG and financial performance (Cek, &Eyupoglu, 2020; Di Tommaso & Thornton, 2020; Shakil, Mahmood, Tasnia&Munim, 2019), ESG and customer loyalty (Albuquerque *et al.*, 2014), ESG and firm market value (Lo &Sheu, 2007) and cost of borrowing and ESG (Goss & Roberts, 2011).

The significance of ESG has motivated several scholars to explore the relationship between ESG and firm performance. These studies concluded different research conclusions such that Al-Najjar and Anfimiadou (2012) and Cek and Eyupoglu (2020) concluded that ESG has positive impact on firm performance. Some other researcher found negative relationship between ESG and firm value and firm performance (Hillman, &Keim, 2001; Di Tommaso, & Thornton, 2020). Similarly, some of the studies concluded no relationship between ESG or certain component of ESG and firm performance (Friede, Busch, &Bassen, 2015; Shakil, Mahmood, Tasnia&Munim, 2019). The reasons behind these results are as follows; first there is lack of comparability in disclosing the ESG information in different sectors, industries and countries in terms of their focus and scope (Al-Najjar &Anfimiadou, 2012; De Silva Lokuwaduge, & de Silva, 2020; Del Giudice &Rigamonti, 2020). Second, the use of different nature of industries such as environmentally sensitive and non-environmentally sensitive industries have also concluded different results for enterprises (De Klerk, De Villiers & Van Staden, 2015; Garcia, Mendes-Da-Silva, &Orsato, 2017). Third, there is a difference in the development stages of both emerging markets and developed markets. Mostly the developed countries are mature in development stage, this is because of the attention paid by different creditors, regulators, shareholders and media to CSR information; on the other hand the emerging countries are still in the early stages of economic development, because these countries pay their attention only to economic growth, financial benefits and scale of production which often neglects ESG activities (Ali, Frynas& Mahmood, 2017).

Despite the increasing relevance of ESG and firm performance over time, most of the data used by these studies were generally outdated, lacks comparability and mostly focused on Europe, USA, Canada, Australia and other developed countries. However, only few studies are so for concentrated to found the impact of ESG practices on firm performance in the wider context of emerging countries. Hence, it is hoped that this study will contributes towards the development of ESG and firm performance literature in emerging countries and fill the gap in this field. Thus, the current study focuses on how ESG relates to firm performance in emerging countries for the period of 2010 to 2019. The current study is based on the perspective of stakeholder theory; which states that the managers needs to satisfy the demands of both the internal and external stakeholders. Thus, the ESG practices are therefore considered as the efforts of management that pacify the demands of stakeholders; and to obtain the significant firm performance.

The rest of the paper is arranged as follows; in section-2 detailed literature about ESG and firm financial performance is provided, in section-3 methodology of the study is given. Section-4 highlights detailed analysis and results. Section-5 describes the conclusions and future recommendations.

2 Literature Review

The literature review includes discussion on various independent and dependent variables with hypothesis development.

2.1 ESG Practices and Firm Performance

There are several studies that have already found the relationship of ESG with firm performance (Brooks &Oikonomou, 2018). Some studies found a positive impact of ESG information disclosure, ESG rating and other ESG issues on firm performance (Friede, Busch &Bassen, 2015). Other studies used the information of ESG for firm operating performance; most of them concluded that ESG practices reduced the corporate financing costs, which ultimately reduced the corporate risk-taking behavior (Di Tommaso & Thornton, 2020; Bolton, 2013; Oikonomou, Brooks &Pavelin, 2014) The study of Deng et al., (2013) highlighted that the companies which are using the ESG information will obtain higher returns on mergers and also gets better operating performance. The study of Ashwin et al., (2016) highlighted that the companies that incorporate ESG activities are less volatile as compared to their competitors in same industry.

Many of the above studies highlighted that there is a positive relationship between firm performance and ESG. However, some other studies have also found negative association between ESG and firm performance such as Hillman and Keim (2001) found that CSR has significant negative impact on market value added. Similarly, Brammer et al., (2004) also concluded a significant negative correlation between CSR and stock returns. Duque-Grisales and Aguilera-Caracuel (2019) used the data of Latin American countries and concluded that ESG has negative impact on firm financial performance. Furthermore, Brammer et al., (2006) highlighted that the companies which are engaged in high ESG activities causes lower shareholder value. Barnea and Rubin (2010) concluded that ESG activities may be regarded as agency costs, as most of the mangers conducts ESG investments to increase their own reputations at the expense of shareholders (Barnea& Rubin, 2010). The companies that engaged in ESG activities maximize shareholder

wealth by scarce resources, thereby squeezing investment and reducing bank value (Barnea& Rubin, 2010; Di Tommaso & Thornton, 2020; Alexander & Buchholz, 1978).

2.2 Research Hypothesis

As different studies concluded different result of ESG and firm performance; this is because of difference in ESG disclosure of information, research methods, evaluation systems and other issues in different countries (Brooks &Oikonomou, 2018; Weber, 2014). The current study analyzed the impact of ESG on firm financial performance by using two different proxies.

2.2.1 ESG and Firm Value

Several studies used the firm value (e.g. price-to-book ratio, market value added and Tobin Q) as a mechanism to measure the firm performance. Many of the prior studies found a positive association between firm value and ESG practices. Such as Fatemi et al., (2018) concluded that investments in ESG has positive effect on firm value and thus it also increases the firm value. Moreover, they also highlighted that low ESG investments decrease the firm value with a moderating role of disclosures, the role of disclosures mitigates the effect of weaknesses and enhance the positive effects. Similarly, Wong et al., (2020) investigated the association of ESG and firm value of developing countries and found that increase in ESG activities will decrease the cost of capital which ultimately increases the value of firm in terms of Tobin's Q. Conversely, many other studies concluded negative relationship between ESG and firm value (Brammer, Brooks and Pavelin, 2006; FisherVanden& Thorburn, 2011). Similarly, many studies concluded that good governance has increase the investors' confidence, and thus as a result it enhanced the firm value (Bebchuk, Cohen & Ferrell, 2010; Gompers, Ishii &Metrick, 2003; Lemmon &Lins, 2002; Siagian, Siregar&Rahadian, 2013).

The empirical studies suggested that it is very difficult to determine the association of ESG and firm performance by using only aggregate ESG score. Several studies also found the relationship with individual component of ESG and firm value. The study of Lucas and Noordewier (2016) highlighted that the environmental activities of the firm increases the firm financial performance by proposing the concept of "dirty industries". Furthermore, Dumitrescu et al., (2020) found that among the other component of ESG only the social dimension has positive relationship with firm value. The prior literature has also highlighted that the governance dimension of ESG bring no additional value to firm (Barney et al., 1991). However, the agency cost can be reduced by governance disclosures which encouraged sustainability and increase the firm value (Giannarakis et al., 2020). Hence, based on the above discussion the current study expects the following hypothesis.

H1a: "The aggregate ESG score has significant positive impact on firm value of emerging countries".

H1b: "The environmental, social and governance scores have significant positive impact on firm value of emerging countries"

2.2.2 ESG and Firm Profitability

The association of CSP/CSR and corporate firm performance (CFP) has been examined since 1970's by several scholars. The study of Aggarwal (2013) claimed that Narver is the first who conducted a study to found the relationship between CSR and CFP in 1971. Furthermore, Griffin and Mahon (1997) also reviewed the 62 prior articles results and found that 33 results have positive, 20 have negative and 9 have no definite correlation between CSR and firm performance. Similarly, the study of Orlitzky, Schmidt and Reynes (2003) have also performed a meta-analysis of 52 empirical studies and found that CSP has positive impact on firm profitability. They further concluded that accounting-based measure of firm performance (e.g. ROA and ROE) are highly correlated with CSP as compared to market-based measures (i.e. Tobins' Q and share price). Waddock and Graves (1997) have also used the different accounting-based measures (i.e. ROA, ROE and return on sales) to analyze the association between firm performance and ESG. They concluded that there is a virtuous circle between ESG and financial performance because of the social and responsible activities of firm.

There are two common type of studies conducted so for in terms of ESG (Clark, Feiner&Viehs (2014), first, almost 85% of ESG studies examined only the individual dimension of ESG (e.g., environmental, social and/or governance) and firm performance; and only 15% of studies have used all the dimensions of ESG at the same time. Thus, these results are mixed in nature (Wood, 2010; Yegnasubramanian, 2008). Second, the other studies focused on socially responsible investments (SRI) funds by examining the portfolio of SRI funds with the group of non-SRI funds to assess the financial performance, stock returns and market valuation (Brammer et al., 2006; Jones et al., 2008). Moreover, the findings of different studies of SRI are mixed, and most of the studies found that there is no significant difference between the performance of SRI funds and non-SRI funds (Clark et al., 2014).

Besides looking at aggregate ESG score, some studies also focused on the relationship of individual dimensions of ESG and firm financial profitability. For example, the study of Russo and Fouts (1997) found a positive association between environmental performance and ROA. Furthermore, King and Lenox (2002) also concluded that there is direct association between environmental dimension (pollution prevention) and ROA. Similarly, Crook, Ketchen, Combs, and Todd (2008) analyzed the social dimension of ESG and concluded that the social dimension has significant positive impact on firm profitability. Similarly, Rodriguez-Fernandez (2016) also found that social policies are positively related to firm performance by identifying the virtuous circle of firm social practices and firm profitability. Thus, the above discussion concluded the following hypothesis.

H2a: "The aggregate ESG score has positive and significant impact on firm profitability emerging countries".

H2b: "The environmental, social and governance dimensions of ESG have positive and significant impact on firm profitability of emerging countries".

3 Methodology

The methodology of the study provides the detail of variables, sample of the study, data collection method and research model of the study.

3.1 Variables' Explanation

3.1.1 Dependent Variable (Firm Performance)

The current study has used the data of emerging countries to find out the impact of ESG on firm performance. Therefore, in this study both the market-based and accounting-based measures of firm performance have been used (Gentry & Shen, 2010). Hence, the firm value and firm profitability are the two proxies which have been used as measurement criteria to assess the dependent variable (i.e. firm performance). It extends and modified the studies of Jang, Lee and Choi (2013), Mishra and Suar (2010) and Simpson and Kohers (2002).

For market-based measurement, the firm value (i.e. Tobin's Q) has been used as proxy to measure the firm performance in emerging countries. Tobin's Q is the ratio of firm market value over the value of firm physical asset (Kim, Chung & Park, 2013). Thus, the firms which are higher in Tobin Q are higher in value as compared to other firms which are low in Tobin's Q value. It is calculated by using the following formula;

Tobin's Q = "Total Market Value of Firm / Total Asset Value of Firm"

For accounting-based measurement ROA has been used as it is the most popular measure of financial performance (Griffin & Mahon, 1997). Moreover, the investors may also consider it the single most significant measure of firm performance (Scott, 2003). The following formula is used to calculate ROA;

ROA = "Net Income / Average of Total Assets"

3.1.2 Independent Variable (ESG measures)

The study used the Thomson Reuters Asset4 ESG data to proxy ESG. Thomson Reuters is highly recognized database worldwide; it provided the transparent, objective, auditable, comparable and systematic ESG information which are used as a comprehensive platform for the assessment of corporate performance (Cheng, Ioannou&Serafeim, 2014). The research analysts of Thomson Reuters used the information of annual reports of companies, company websites, CSR reports, stock exchange filings, NGO's websites and news sources to collect the 900 evaluation points per firm and all the data are objective and publicly available. After that, 250 key performance indicators (KPIs) has been calculated from these 900 evaluation points; which are further organized into 18 categories within four performance dimensions scores i.e., economic, social, environmental and governance. As the economic performance score is considered irrelevant therefore, the current study has also excluding this dimension similar like previous studies such as Cheng, Ioannou and Serafeim (2014) and Ioannou and Serafeim (2012).

3.1.3 Control Variables

Following the previous studies (e.g., Benlemlih&Girerd-Potin, 2014; El Ghoul *et al.*, 2011; Ioannou & Serafeim, 2012; Oikonomou, Brooks &Pavelin, 2012; Salama et al., 2011) this study has also considered that corporate financial characteristics that affect both the ESG and firm performance. Hence, in this study different control variables i.e. firm size (SIZE), market to book market to equity (MTB), dividend yield (DY), leverage (LEV), solvency (SOL) and retention (RET) were also been used. Finally, the study has also taken into account the industry and year as dummy variables.

3.2 Sample and Data Collection

The sample of the study consists of 27 emerging countries (MSCI, 2019) with a total number of 1966 of companies based on their data available on Asset4 for the period of 2010 to 2019. The purposive sampling

technique has been used in which the purpose is to select all those companies which are using ESG practices and their data are available on Asset4. Further, the final sample has been reduced to 1042 companies after removing the companies with missing data. The ESG data has been collected from Thomson Reuters Asset4 ESG index (Cheng et al., 2014; Garcia, Mendes-Da-Silva & Orsato, 2017). The data of firm performance (i.e. Tobin's Q and ROA); and control variables data have also been extracted from DataStream available on Thomson Reuters Database.

3.3 Estimation Techniques

The current study relies on the panel data regression analysis to estimate the impact of ESG on firm value and firm profitability (Jang et al., 2013; Saleh et al., 2011). Two models are used to test the hypotheses of the study; model 1.1 and model 1.2 are used to test the hypotheses H1a and H1b; model 2.1 and model 2.2 are used to test hypothesis H2a and H2b. Following are the main models used in this study:

$$TQ_{it} = \beta_0 + \beta_1 L\_ESG_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 DY_{it} + \beta_6 RET_{it} + \beta_7 SOL_{it} + \varepsilon \tag{1.1}$$

$$TQ_{it} = \beta_0 + \beta_1 L\_ENV_{it} + \beta_2 L\_SOC_{it} + \beta_3 L\_GOV_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + \beta_6 MTB_{it} + \beta_7 DY_{it} + \beta_8 RET_{it} + \beta_9 SOL_{it} + \varepsilon \tag{1.2}$$

$$ROA_{it} = \beta_0 + \beta_1 L\_ESG_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \beta_4 MTB_{it} + \beta_5 DY_{it} + \beta_6 RET_{it} + \beta_7 SOL_{it} + \varepsilon \tag{2.1}$$

$$ROA_{it} = \beta_0 + \beta_1 L\_ENV_{it} + \beta_2 L\_SOC_{it} + \beta_3 L\_GOV_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + \beta_6 MTB_{it} + \beta_7 DY_{it} + \beta_8 RET_{it} + \beta_9 SOL_{it} + \varepsilon \tag{2.2}$$

Where:

ROA = Return on Assets; TQ = Tobin's Q; L_ESG = ESG score; L_ ENV = Environmental score; L_SOC = Social score; L_GOV = Governance score; LEV = Leverage of company; SIZE = Total Assets; DY = Dividend Yield; MTB = Market to Book Value; RET = Retention of the company; SOL = Company Solvency; i = Number of Companies (i.e. 1042) and t = Time Period (i.e. 2010 to 2019).

4 Results and Discussions

In this study, the secondary data of 27 emerging countries are selected for the period of 2010 to 2019. The detail results of descriptive statistics, the correlation matrix, model specification tests, and the regression analyses are presented in this section.

4.1 Descriptive Statistics

The results of the descriptive statistics are given in table 1. It represents the total number of observations of all the variables; the values of their minimum, maximum, mean, and standard deviation. The result showed that the mean value of ESG is 46.12, its standard deviation; minimum and maximum values are 19.169, 1.89 and 100 respectively. Similarly, the mean and standard deviation of ENV are 42.873 and 24.762 respectively, its minimum value is 1 and the maximum value is 98.33. The mean of GOV is 46.962 and its standard deviation is 24.423 and its minimum and maximum values are 1.11 and 97.5 respectively. The mean value of GOV is 51.871

its standard deviation is 21.996; and its minimum and maximum values are 1.23 and 98.34 respectively. The mean values of LESG, LENV, LSOC and LGOV are 1.616, 1.513, 1.578 and 1.661. The values of their standard deviations are 0.224, 0.386, 0.339 and 0.243 respectively. Similarly, the minimum values of these variables are 0.276, 0, 0.045 and 0.09; and their maximum values are 2, 1.993, 1.989 and 1.993 respectively.

The mean values of the dependent variables such that ROA and TQ are 0.062 and 1.781; their standard deviations are 0.071 and 1.165 respectively. The minimum values of these variables are 0.001 and 0.053; the maximum values are 1.233 and 23.268 respectively. The mean values of control variables such as LIQ, SOL, RET, SIZE, MTB, DY and LEV are 1.757, 0.458, 10.007, 8.225, 1.916, 2.837 and 0.289 respectively; the standard deviations of these variables are 1.294, 0.185, 12.402, 1.128, 2.257, 2.449 and 0.151 respectively. The minimum values of these variables are 0.228, 0.079, 0, 6.108, 0.12, 0 and 0.005; their maximum values are 8.586, 0.889, 60911, 10952, 14.233, 12 and 0.742 respectively.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Independent Variables					
ESG	6280	46.12	19.169	1.89	100
ENV	6280	42.873	24.762	1.00	98.33
SOC	6280	46.962	24.423	1.11	97.5
GOV	6280	51.871	21.996	1.23	98.34
LESG	6280	1.616	0.224	0.276	2.000
LENV	6280	1.513	0.386	0	1.993
LSOC	6280	1.578	0.339	0.045	1.989
LGOV	6280	1.661	0.243	0.09	1.993
Dependent Variables					
ROA	6280	0.062	0.071	0 .001	1.233
TQ	6280	1.781	1.615	0.053	23.268
Control Variables					
LIQ	5599	1.757	1.294	0.228	8.586
SOL	5599	0.458	0.185	0.079	0.889
RET	5599	10.007	12.402	0	60.911
SIZE	5599	8.225	1.128	6.108	10.952
MTB	5599	1.916	2.257	0.12	14.233
DY	5599	2.837	2.449	0	12
LEV	5599	0.289	0.151	0.005	0.742

2. **Source:** Author's Compilation

4.2 Correlation Matrix

Table 2 presents the results of the correlation matrix. It is used to show the correlation among the entire dependent, independent and control variables. Generally, it is expected that all the independent variables are positively associated with dependent variables. The variables which have more than 90% correlation value suggested the existence of multicollinearity. Thus, in order to avoid the problem of multicollinearity in regression analysis, these variables should not be included in regression analysis (M. H. Shah & Afridi, 2015). The results showed that the LSOC has the highest correlation value of 0.859; and the LEV has the

lowest correlation of 0.001. Moreover, the results also highlighted that all the variables have less than 90% correlation values; therefore, there is no multicollinearity exists.

Table 2: Correlation Matrix

Variables	TQ	LESG	LENV	LSOC	LGOV	LEV	DY	MTB	SIZE	RET	SOL
TQ	1.000										
LESG	0.051	1.000									
LENV	0.024	0.786	1.000								
LSOC	0.073	0.859	0.635	1.000							
LGOV	0.013	0.626	0.310	0.377	1.000						
LEV	-0.062	0.013	0.001	-0.008	0.036	1.000					
DY	-0.080	0.090	0.075	0.081	0.032	-0.004	1.000				
MTB	0.848	0.043	0.014	0.060	-0.011	0.003	-0.051	1.000			
SIZE	-0.122	0.130	0.178	0.120	0.036	-0.065	-0.087	-0.092	1.000		
RET	-0.028	0.016	0.042	0.015	-0.040	-0.013	0.017	0.348	0.002	1.000	
SOL	0.110	-0.016	-0.002	-0.011	-0.048	-0.113	0.003	0.411	-0.062	0.856	1.000

Source: Author's Analysis

4.3 Tests for Multicollinearity

Variance Inflation Factor (VIF) and correlation matrix are used to check the multicollinearity. The results of correlation matrix are given in table 2. The results concluded that there is no multicollinearity among the variables as all the values of correlation matrix are below 0.90. Similarly, the results of VIF of all the models are given in table 3. If the value of VIF is more than five than it is suggested that there is a problem of multicollinearity (Gujrati, 2005). The results concluded that the values of all the variables in different models have less than five; which signifies that there is no multicollinearity exists among the variables.

Table 3: Variance Inflation Factor (VIF)

Model-1	(LENV)	Model-2	(LSOC)	Model-3	(LGOV)	Model-4	(LESG)
Variables	VIF	Variables	VIF	Variables	VIF	Variables	VIF
SOL	3.19	SOL	3.188	SOL	3.179	SOL	3.189
RET	2.908	RET	2.898	RET	2.893	RET	2.899
MTB	1.219	MTB	1.227	MTB	1.218	MTB	1.224
SIZE	1.073	SIZE	1.055	SIZE	1.04	SIZE	1.058
LEV	1.051	LEV	1.052	LEV	1.053	LEV	1.052
LENV	1.047	LSOC	1.032	LGOV	1.006	LESG	1.035
DY	1.022	DY	1.023	DY	1.015	DY	1.025
Mean VIF	1.93	Mean VIF	1.925	Mean VIF	1.915	Mean VIF	1.926

Source: Author's Analysis

4.4 Tests for Heteroskedasticity

The test of heteroskedasticity has also been used to detect the presence of heteroskedasticity in panel data analysis. The presence of heteroskedasticity will lead to bias of standard errors which leads to misleading in regression results. The results of heteroskedasticity are given in table 4. The Breusch-Pagan/Cook-Weisberg tests were employed to detect the presence of heteroskedasticity. The results confirm the presence of heteroskedasticity.

Table 4: Heteroskedasticity Test

Model with Independent Variables	Chi-square Statistics	P-Values
LENV	74723.40	0.0000
LSOC	74320.72	0.0000
LGOV	74466.41	0.0000
LESG	74282.46	0.0000

Source: Author's Analysis

4.5 Tests for Autocorrelation

The Wooldridge test is used to detect the presence of autocorrelation in panel data. The results of autocorrelation are given in table 5. The results highlighted that there is no serious problem of autocorrelation among the variables as the hypothesis of autocorrelation is rejected for all the variables.

Table 5: Test for Autocorrelation

Model with Independent Variables	F-Statistics	P-Values
LENV	0.125	0.7322
LSOC	0.123	0.7342
LGOV	0.129	0.7278
LESG	0.126	0.7313

3. **Source:** Author's Analysis

4.6 Model Specification Test

Hausman (1978) specification test is used to select between the fixed effects model and random effects model (Greene, 2008). The significant p-value proposed to use a fixed-effects model otherwise random effects model should be used (Klarner, 2010). The results of the Hausman (1978) test showed insignificant

p-value for all the models which confirmed that the random effects model is the most appropriate model for panel data regression estimation. The results of Hausman (1978) tests for all the models are given in table 6.

Table 6: Hausman Specification Tests

Models	Choose Between	Chi- Square Value	P-Value	Results
1 & 2 (LENV)	Random Effects and Fixed Effects Models	10.067	0.185	Use Random Effects Model
3 & 4 (LSOC)	Random Effects and Fixed Effects Models	5.175	0.639	Use Random Effects Model
5 & 6 (LGOV)	Random Effects and Fixed Effects Models	5.29	0.625	Use Random Effects Model
7 & 8 (LESG)	Random Effects and Fixed Effects Models	7.79	0.351	Use Random Effects Model

Source: Author's Analysis

4.7 Regression Results of ESG and Firm Performance

4.7.1 The Impact of ESG Factors on Firm Value (Tobin's Q)

The results of random effects models based on the Hausman specification test for regression analysis while using Tobin's Q as a proxy for firm performance are shown in Tables 7. The results of all the random effects models showed that individually ENV, SOC and GOV scores and combined ESG score have significant positive impact on Tobin's Q (firm performance). This means that the companies which are using ESG information are better than those companies which are not using the ESG information. Moreover, the results also confirmed that the control variables such as Lev, DY, Size, RET and SOL have significant negative impact on firm performance. Conversely, MTB is the only single control variable that has significant positive impact on Tobin's Q.

Table 7: Fixed Effects and Random Effects for Tobin's Q

Variables	(FE) Tobin Q	(RE) Tobin Q	(FE) Tobin Q	(RE) Tobin Q	(FE) Tobin Q	(RE) Tobin Q	(FE) Tobin Q	(RE) Tobin Q
LENV	.049** (.025)	.050** (.024)						
LSOC			.135*** (.028)	.124*** (.027)				
LGOV					.103*** (.038)	.101*** (.038)		
LESG							.16*** (.043)	.146*** (.042)
Lev	-.872*** (.06)	-.876*** (.06)	-.876*** (.06)	-.879*** (.06)	-.882*** (.06)	-.884*** (.06)	-.878*** (.06)	-.881*** (.06)
DY	-.019*** (.003)	-.02*** (.003)	-.018*** (.003)	-.019*** (.003)	-.018*** (.003)	-.019*** (.003)	-.019*** (.003)	-.02*** (.003)
MTB	.345*** (.002)	.345*** (.002)	.346*** (.002)	.346*** (.002)	.346*** (.002)	.346*** (.002)	.345*** (.002)	.346*** (.002)
SIZE	-.076*** (.008)	-.075*** (.008)	-.072*** (.008)	-.072*** (.008)	-.071*** (.008)	-.071*** (.008)	-.075*** (.008)	-.075*** (.008)
RET	-.007*** (0.000)	-.007*** (0.000)	-.007*** (0.000)	-.007*** (0.000)	-.007*** (0.000)	-.007*** (0.000)	-.007*** (0.000)	-.007*** (0.000)
SOL	-.312*** (.028)	-.309*** (.028)	-.316*** (.028)	-.314*** (.028)	-.316*** (.028)	-.314*** (.028)	-.313*** (.028)	-.31*** (.028)
Iid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
cid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	No	No	No	No	No	No	No	No
_cons	1.976*** (.083)	1.994*** (.082)	2.126*** (.079)	2.132*** (.079)	1.983*** (.096)	1.99*** (.096)	1.925*** (.095)	1.947*** (.094)
Obs	6280	6280	6280	6280	6280	6280	6280	6280

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1*
Source: Author's Analysis

Besides the significant results of random effects model, the current study has detected the problem of heteroskedasticity while using the random effects model. Therefore, the feasible generalized least square (FGLS) model is the most appropriate model, if there is a problem of heteroskedasticity. Therefore, the FGLS model has also been used in this study for robust results.

The results of FGLS are given in table 8. The results showed that all the individual components of ESG (i.e. ENV, SOC and GOV) have significant and positive impact on Tobin's Q. Similarly, the aggregate ESG score has also showing the positive and significant relationship with Tobin's Q. Moreover, the results of control variables (i.e. Lev, DY, Size and RET) have significant negative relationship with firm performance.

However, the result of SOL has become positive and significant in FGLS model while this was negative in random effects model. Similarly, MTB has also significant and positive impact on Tobin's Q.

Table 8: FGLS for Firm Performance (Tobin's Q)

Variables	(Model-1) Tobin Q	(Model-2) Tobin Q	(Model-3) Tobin Q	(Model-4) Tobin Q
LENV	.025** (.023)			
LSOC		.125*** (.027)		
LGOV			.083** (.036)	
LESG				.134*** (.04)
LEV	-.823*** (.056)	-.82*** (.056)	-.827*** (.056)	-.825*** (.056)
DY	-.014*** (.003)	-.015*** (.003)	-.014*** (.003)	-.014*** (.003)
MTB	.36*** (.002)	.359*** (.002)	.36*** (.002)	.359*** (.002)
SIZE	-.064*** (.008)	-.068*** (.008)	-.064*** (.008)	-.067*** (.008)
RET	-.006*** (0.000)	-.006*** (0.000)	-.006*** (0.000)	-.006*** (0.000)
SOL	.377*** (.026)	.373*** (.026)	.376*** (.026)	.373*** (.026)
Iid	Yes	Yes	Yes	Yes
cid	Yes	Yes	Yes	Yes
Years	No	No	No	No
_cons	11.78* (6.054)	17.276*** (6.064)	11.773** (5.958)	15.287** (6.069)
Observations	6854	6854	6854	6854

Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1* **Source:** Author's Analysis

4.7.2 The Impact of ESG Factors on Firm's Profitability

The second method that is used to measure the firm performance is ROA. Here, the Hausman specification test has also been used to determine between fixed effects model and random effects model for panel data regression analysis of firm profitability (ROA). The results concluded that all the models have significant p-values which confirmed that the fixed effects model is most appropriate model for panel data regression analysis while using ROA. The results of fixed effects model based on Hausman test are given in table 9. The results concluded that all the pillar wise and combined ESG score have significant positive impact on firm performance in terms of ROA. These results are similar to the findings of Tobin's Q. However, the

result of ROA is different form Tobin's Q in case of control variables as DY, MTB, Size and SOL have positive and significant impact on ROA. While these variables were show significant negative impact on Tobin's Q. The only LEV and RET have significant negative relationship with ROA.

Table 9: Fixed Effects Model for Firm Performance (ROA)

Variables	(FE) ROA	(RE) ROA	(FE) ROA	(RE) ROA	(FE) ROA	(RE) ROA	(FE) ROA	(RE) ROA
LENV	.007*** (.002)	.009*** (.002)						
LSOC			.005** (.002)	.004** (.002)				
LGOV					.007** (.003)	.006** (.003)		
LESG							.001 (.003)	.007** (.003)
LEV	-.046*** (.005)	-.046*** (.005)	-.046*** (.005)	-.046*** (.005)	-.046*** (.005)	-.046*** (.005)	-.046*** (.005)	-.046*** (.005)
DY	.001*** (0)	.001*** (0)	.001*** (0)	.001*** (0)	.001*** (0)	.001*** (0)	.001*** (0)	.001*** (0)
MTB	.009*** (0)	.009*** (0)	.009*** (0)	.009*** (0)	.009*** (0)	.009*** (0)	.009*** (0)	.009*** (0)
SIZE	.003*** (.001)	.003*** (.001)	.003*** (.001)	.003*** (.001)	.003*** (.001)	.003*** (.001)	.003*** (.001)	.003*** (.001)
RET	-.001*** (0)	-.001*** (0)	-.001*** (0)	-.001*** (0)	-.001*** (0)	-.001*** (0)	-.001*** (0)	-.001*** (0)
SOL	.041*** (.002)	.042*** (.002)	.04*** (.002)	.041*** (.002)	.041*** (.002)	.042*** (.002)	.041*** (.002)	.042*** (.002)
iid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
cid	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
_cons	.019*** (.007)	.024*** (.007)	.029*** (.006)	.032*** (.006)	.018** (.008)	.021*** (.008)	.024*** (.008)	.032*** (.008)
Obs	6599	6599	6599	6599	6599	6599	6599	6599

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1***Source:** Author's Analysis

Similarly, like Tobin's Q the heteroskedasticity has also been detected by using fixed effects models for measuring ROA. Therefore, FGLS has further being used for robust results. The results of FGLS are given in table 10. The results of FGLS for ROA are similar like Tobin's Q as all the independent variables both pillar wise and aggregate ESG score have significant positive impact on ROA. Moreover, some of the control variables (i.e. DY, MTB, Size and SOL) have positive and significant impact on ROA. While, LEV and RET have significant negative impact on ROA.

Table 10: FGLS for Firm Performance (ROA)

Variables	(LENV) ROA	(LSOC) ROA	(LGOV) ROA	(LESG) ROA
LENV	0.005** (.002)			
LSOC		0.009*** (.002)		
LGOV			.007** (.003)	
LESG				.005** (.002)
LEV	-.03*** (.004)	-.029*** (.004)	-.03*** (.004)	-.029*** (.004)
DY	.001*** (0)	.001*** (0)	.001*** (0)	.001*** (0)
MTB	.009*** (0)	.009*** (0)	.009*** (0)	.009*** (0)
SIZE	.004*** (.001)	.005*** (.001)	.004*** (.001)	.004*** (.001)
RET	-.001*** (0)	-.001*** (0)	-.001*** (0)	-.001*** (0)
SOL	.049*** (.002)	.049*** (.002)	.049*** (.002)	.049*** (.002)
fid	Yes	Yes	Yes	Yes
iid	Yes	Yes	Yes	Yes
cid	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes
_cons	3.37*** (.556)	2.93*** (.552)	3.38*** (.546)	3.191*** (.555)
Observations	6599	6599	6599	6599

*Standard errors are in parentheses*** p<.01, ** p<.05, * p<.1* **Source:** Author's Analysis

5. Conclusions and Recommendations

The purpose of the current study is to find out the impact of ESG on firm performance in emerging countries. The study used two proxies' i.e. firm value (Tobin's Q) and firm profitability (ROA) to measure the firm performance. Moreover, the study has also used the aggregate ESG score and pillar wise ESG (i.e. ENV, SOC and GOV) scores to determine the firm performance in emerging countries. The results of the first proxy e.g. firm value highlighted that both the pillar wise ENV, SOC and GOV scores and aggregate ESG score are significantly and positively related to Tobin's Q in both random effects model and FGLS

regressions respectively. Thus, it means that the firms with high ESG scores are less risky, which reduced the firm discount rate and ultimately it increases the firm value (Derwall, 2007). In addition, the firm value has also reflected the investors perception towards sustainability (Derwall, 2007), so the companies which have high ESG performance benefit more from high market value. Similar results were also found by Waddock and Graves (1997), Derwall (2007), and Flammer (2013).

Moreover, the results of random effects model also showed that the control variables (i.e. Lev, DY, SIZE, RET and SOL) have negative but significant impact on firm performance. Conversely, only MTB has significant positive impact on firm performance. Similarly, the results FGLS for control variables (i.e. LEV, DY, Size and RET) have significant negative relationship with firm performance. However, the result of SOL has become positive and significant in FGLS model while this was negative in random effects model. Similarly, MTB has also significant and positive impact on Tobin's Q.

Similarly, the results of the second proxy e.g. firm profitability showed that the pillar wise ENV, SOC and GOV score and ESG aggregate score are significant positive impact on ROA by both fixed effect model and FGLS regressions accordingly. The study found significant evidence that the ESG is an important determinant that impacts the firm performance positively. These results are consistent with previous studies of Varadajara and Menon (1988), Porter and Kramer (2006); (2011) and Koelher and Hespenheide (2012). These results are similar to the findings of Tobin's Q used in this study. However, the results of fixed effects model for ROA is different form Tobin's Q in case of control variables as DY, MTB, Size and SOL have positive and significant impact on ROA. While these variables were show significant negative impact on Tobin's Q. The only LEV and RET have significant negative relationship with ROA. Moreover, the results of control variables in case of FGLS are also different from fixed effects models. The results showed that some of the control variables (i.e. DY, MTB, Size and SOL) have positive and significant impact on ROA. While, LEV and RET have significant negative impact on ROA. The findings of the study also validate the alternate hypothesis which states that aggregate ESG and pillar wise components of ESG are positively and significantly associated with firm performance.

The current study has used the data of all the emerging countries; in future the comparison of developed and emerging countries should also be used. Similarly, the mediating role of risk in ESG and firm financial performance is also a way of future studies. Moreover, the moderating role of legal environment should also be used for future research.

Authors' Declaration

We confirm that the paper has not been published previously, it is not under consideration for publication elsewhere, and the manuscript is not being simultaneously submitted elsewhere.

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