

# Mandatory CSR spending, ESG and firm performance: evidence from Bombay stock exchange

CSR, ESG and  
firm  
performance

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137

Received 17 August 2022  
Revised 21 December 2022  
12 May 2023  
21 July 2023  
Accepted 21 September 2023

## Abstract

**Purpose** – The study attempts to examine the impact of mandatory corporate social responsibility (CSR) spending and inclusion of firms into the environment, social and governance (ESG) index of BSE India on the performance of firms constituting firms under the Bombay Stock Exchange (BSE) 100 Index.

**Design/methodology/approach** – The stock prices of the firms were collected from the official website of BSE India for a total of 32 firms and the System Generalized Method of Moments (GMM) model was utilized for analyzing the data for the present study.

**Findings** – The study found that the investors in the Indian market do consider the CSR spending and ESG listing as a factor while framing the investment strategy; however, ESG listing is least preferred. Among the other variables, AGE, DPS, EPS and BVPS have a significant positive bearing on the firm's performance, while SIZE has a significant negative impact on the firm's performance.

**Research limitations/implications** – Further investigation is needed to understand the factors that influence investment decision-making, including why investors tend to overlook CSR and environmental protection. Future research can identify ways to increase the importance of these factors in investment decision-making. Future research can explore the long-term impact of investing in socially responsible companies, including whether such investments lead to better long-term performance.

**Practical implications** – There is a need for increased awareness of the importance of CSR among investors. Educational programs and campaigns can be used to inform investors about the potential benefits of considering social responsibility factors in investment decision-making. Companies that prioritize CSR and environmental protection should distinguish themselves from competitors in the eyes of investors. This can lead to higher investment and potentially higher returns for these companies.

**Originality/value** – Since mandatory CSR expenditure and the launch of the ESG index by the BSE have been introduced in India recently, hardly any study in India has examined the impact of the same on the firm's performance.

**Keywords** Bombay stock exchange, ESG, GMM model, Mandatory CSR spending

**Paper type** Research paper

## 1. Introduction

Historically, the finance theories put forward that the sole objective of a manager is to enhance the wealth of the shareholders (Pandey, 2015). It is being argued that earnings and increasing profit is the sole responsibility of business, which shall add to the wealth of shareholders; in contrast, spending a firm's resources on social causes deprives the shareholders and consequently, the shareholders' wealth will decrease (Humphrey *et al.*, 2012). However, in today's time, the scenario has changed completely, and significant pressure is being placed on

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firms to enhance and improve corporate social performance, reporting and responsibility, and to consider the environment, social and governance (ESG) as an integral part of business practices. Environmental regulation and protection significantly affect a firm's financial and stock market performance (Dahal and Das, 2022). Kawashima and Takeda (2012) also observed a dramatic collapse in the market value of a share in the event of bad corporate social responsibility (CSR) practices. The outcome of the study conducted by (Mishra and Suar, 2010) also found that good CSR practices can be profitable for a firm and thus can increase the value of the share. Therefore, in today's time, as the level of awareness among the investors is increasing regarding the environment and considering the strict regulation and policies of the government, business organizations have started to adopt environment-friendly ways of conducting business operations. Among various environment-friendly ways, CSR activities are one that the firms mainly undertake in order to differentiate themselves from their competitors, which are also referred to as 'investment with values' (Keefe, 2007).

Another important aspect of value investing is ESG, which has received increasing importance in the recent past from various stakeholders such as investors, managers and creditors. ESG is referred to as a firm's obligation to enhance and improve social welfare and equitable and sustainable long-term wealth for its stakeholders (Jamali *et al.*, 2017; Turban and Greening, 1997). Also, it has been found that firms compliant with ESG have better governance, are well aware of environmental factors and focus on sustainable development. Moreover, they seem to have lesser stock market volatility and have easy access to low-cost funds (Kumar 2020). Besides the above, integrating ESG into a firm's value has a direct and positive relationship with consumer satisfaction, market acceptance and societal value (Schramade and Schoenmaker, 2018) and also enhances the equity premium of the firm (Schramade, 2016), which enables the firm to gain a competitive advantage over its competitors Jasni *et al.* (2019). However, Nelson (2017) noted that firms use ESG only to increase their reputation in the eyes of investors, and some firms use it as a means to reduce regulatory restrictions (Porter *et al.*, 2019).

Considering the importance of CSR and ESG for any firm and also looking at the increasing awareness among the investors, numerous studies have been conducted to capture the behavior of the stock market in relation to the CSR and ESG practices of the firms. However, the research related to CSR and ESG are lacking in emerging nations like India, and at the same time, a difference exists in terms of findings at the outset of the studies. One group of researchers found a positive relationship of ESG performance and CSR with financial and stock market performance for Indian firms (Chelawat and Trivedi, 2016; Maqbool and Zameer, 2018; Fahad and Nidheesh, 2020), while Fahad and Busru (2021) found that the CSR disclosure has a negative impact on the profitability and performance of firms listed in the BSE 500 index. Although a positive impact of ESG on firm performance is seen in both financial and stock markets (Dalal and Thaker, 2019), firms with a high score in ESG seem to be more volatile in the long run (Aggarwal, 2022).

Based on the above drawbacks, the present study has been initiated to bridge the gap in the existing literature and provide a better insight into the behavior of market participants towards value investing in the context of the Indian stock market. The study shall consider the amount spent on CSR and incorporation of firms into the ESG group by the Bombay stock exchange and attempts to examine firm's performance as proxied by Tobin's Q.

## 2. Literature review

Shareholders who are more concerned about increasing their wealth use accounting information to predict the share prices. It is evident from previous research that accounting information like earnings and book value has a strong relationship with stock price (Beaver *et al.*, 1987; Burgstahler and Dichev, 1997; Riffe and Thompson, 1998) and thus has been used from long time by the shareholders to predict the share price. But now, with the growing need

to protect the stakeholders' interest and the environment from degradation, the expenditure relating to these items also finds a major place in accounting reporting and thus can affect the stock market performance. The concept of CSR at its earliest was put forward by [Dodd \(1932\)](#) and [Bowen \(2013\)](#), who advocated that the business houses should be concerned for society in addition to profit making. Since then, the concept has been voluntarily accepted by business houses around the globe. It was in the year 2014 that CSR was made mandatory by the government of India, and since then, an upswing has been witnessed among the researchers to identify, explore and examine the impact of the same on the operation of business houses.

Literature related to disclosure practices of CSR and ESG in different countries shows that the developed nations have better disclosure practices compared with developing nations. The study conducted by [Bhatia and Makkar \(2019\)](#) relating to the nature and extent of CSR reporting practices in BRICS (Brazil, Russia, India, China, and South Africa) nations (developing countries) and developed nations (USA and UK) found that developed nations have higher CSR disclosure scores than developing nations. In an emerging economy like India, the disclosure of CSR and ESG related practices are new and is confined mostly to the public sector companies in comparison to the private sector ([Garg, 2016](#)).

### 2.1 Theoretical framework

The relationship between CSR and firm performance was explained mainly by two main theories viz. (1) social exchange theory ([Blau, 1964](#); [Cropanzano and Mitchell, 2005](#)) and (2) stakeholder theory ([Freeman, 1984](#); [Donaldson and Preston, 1995](#); [Wood and Jones, 1995](#); [Orlitzky et al., 2003](#); [Jamali, 2008](#); [Kumar and Tiwari, 2011](#); [Gherghina et al., 2015](#)). Additionally, agency theory ([Eisenhardt, 1989](#)) can also be used to find out a linkage between CSR and firm performance.

The "reciprocity" idea is the foundation of [Blau's \(1964\)](#) social exchange theory, which holds that if a firm treats society fairly, kindly and charitably, then the same kind of deeds will be returned to the firm by the society ([Cropanzano and Mitchell, 2005](#)). This relationship develops into one of trust, loyalty and commitment through time ([Farooq et al., 2013](#)). Therefore, the social exchange theory explains the positive association between CSR and firm performance.

Stakeholder theory ([Freeman, 1984](#)), observed that a firm's value and performance may be influenced by the planned procedures it takes to meet the expectations and benefits of its various stakeholders. Additionally, a CSR strategy that prioritizes the needs of internal stakeholders (such as employees, managers and directors) could boost staff morale and productivity, which in turn could boost the firm's financial performance ([Huselid, 1995](#); [Cho et al., 2006](#); [Frank and Obloj, 2014](#)). The short-term profitability and operational effectiveness of a company may not be directly impacted by CSR for external stakeholders. However, it might aid in the establishment of a positive reputation and a rise in customer satisfaction, thus increasing a firm's future and stock market value ([Luo and Bhattacharya, 2009](#); [Kang et al., 2010](#); [Singal, 2014](#)).

The relationship between the managers (agents) and the shareholders (principals) is described by the agency theory ([Donaldson and Davis, 1991](#)). It aims to settle conflicting interests between the organization's management and the owners by outlining strategies for doing so, such as giving project managers the authority to make decisions. Managers are interested in CSR spending to build the company image ([Gherghina et al., 2015](#)), but this on the other hand can upset the shareholders as this can reduce their dividend income ([Humphrey et al., 2012](#)). So, this can increase the agency cost, but according to the agency theory, if agency costs are kept to a minimum, firms may see an increase in financial performance. Thus, it can be concluded that CSR and firm performance has negative relationship ([Chin et al., 2013](#)).

Hence, it is observed that CSR and firm performance have a positive relationship as per the social exchange theory and stakeholder theory; however, as per agency theory, CSR and firm performance have a negative relationship due to higher agency costs.

### *2.2 Empirical evidence*

With a rise in CSR related awareness among the stakeholders, it has been observed by [Kansal and Joshi \(2014\)](#) in their study that the stakeholders have a keen interest in such initiatives by the companies and thus those companies enjoy higher corporate goodwill and a higher level of investors' confidence leading to higher stock prices. [Yu et al. \(2018\)](#) who examined the level of transparency in ESG disclosure and its impact on firm value, found that the higher the disclosure, the higher is the firm value, as measured by Tobin's Q. [Chelawat and Trivedi \(2016\)](#), while examining the effect of ESG performance of Indian firms on the financial performance, found a significant positive relation between ESG performance and financial performance; a similar result was also observed by [Garg \(2016\)](#), whose study revealed that CSR has a significant and long-term impact on firm performance. [Jadiyappa et al. \(2021\)](#) also observed an enhancement in the value of Indian firms as the implementation of CSR was made mandatory in India. [Maqbool and Zameer \(2018\)](#) examined the relationship between CSR and financial performance in the Indian context from 2007 to 2016 and observed a positive relationship between financial performance and CSR. [Bhattacharyya and Rahman \(2019\)](#), [Singh and Chakraborty \(2021\)](#) and [Oware and Mallikarjunappa \(2022\)](#) also found a positive relationship between CSR and financial performance. [Sharma et al. \(2020\)](#) observed a positive relation between ESG and ROA (Return on Asset). [Wan Mohammad and Wasiuzzaman \(2021\)](#) also observed that ESG disclosure improves firm performance. [Zhou et al. \(2022\)](#) revealed that the improvement of the ESG performance of listed companies can improve the market value of the company.

However, there are many studies which show a different story altogether. [Bhattacharyya and Rahman \(2020\)](#) examined the impact of mandatory CSR expenditure on the firm's stock return using the ordinary least square (OLS) method and documented that mandatory CSR expenditure has a negative impact on the stock returns of Indian firms. [Fahad and Busru \(2021\)](#) examined the effect of CSR disclosure on the performance of firms from the emerging market of India during 2007-2016 and found a negative impact of CSR disclosure on the firm's profitability and value. [Alareeni and Hamdan \(2020\)](#) examined the relationship between ESG disclosure and a firm's operation (ROA), financial performance (Return on Equity (ROE)) and market performance (Tobin's Q) during the period from 2009 to 2018. The study revealed that the ESG disclosure positively impacts the firm's operation (ROA); however, the subcomponents of ESG and CSR disclosure are negatively associated with ROA and ROE and positively with Tobin's Q. On the other hand, [Garg and Gupta \(2020\)](#) found that the public sector firms complying with CSR have lower firm performance; however, no difference in the performance is observed for private sector firms. [Garg et al. \(2021\)](#) inspected the relevance of CSR expenditure to the firms in the mandatory regime and established that CSR expenditure has no influence on stock returns. [Oware and Iddrisu \(2021\)](#) surveyed whether the shift from voluntary to mandatory reporting increases the moral capital of CSR and whether this affects the firm performance of listed firms in India and found that a shift from voluntary to mandatory policy on CSR increases the moral capital value of listed firms in India; however, there is no significant relation with stock price returns or Tobin's Q.

The literature review indicates that numerous studies in India and abroad have been conducted to examine the association between firm performance and CSR disclosure and have reported mixed results. In India, w.e.f. April 2014, the CSR expenditure was made mandatory for firms with a net worth of INR 500 crores or more, or an annual turnover of INR 1000 crores or more or a net profit of INR 5 crore or more. Again, in October 2017, the Bombay stock exchange launched an index in the name of SandP BSE 100 ESG and included those

firms which qualify for the ESG criterion. Since mandatory CSR expenditure and the launch of the ESG index by the BSE have been introduced in India recently, hardly any study in India has examined the impact of the same on the firm's performance. Thus, the present study attempts to fill the gap in the available literature. Further, the following variables have been identified from the review of the literature to be included in the present study.

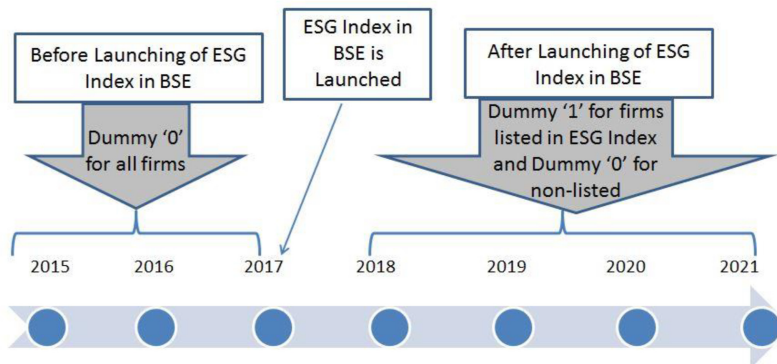
### 3. Methodology

#### 3.1 Sample and study period

By analyzing the relevant literature, it has been noted that the number of studies conducted on CSR expenditure, incorporation of a firm in the ESG group and firm performance in the Indian context are comparably lesser than that of developed nations. Thus, in the present study, firms constituting the BSE 100 index have been considered and this will be studied to find out the relation between CSR, ESG and firm performance during the period 31st March 2015 to 31st March 2021. Out of the total selected firms, they have been further segregated as per their listing in the ESG Index of the BSE. Since the ESG Index was launched in 2017, the firms listed in the ESG Index have been assigned Dummy "1" from its launch year and the firms which are not listed there are assigned Dummy "0" and the same has been portrayed in Figure 1. Proceeding further, the data relating to the said variables in Table 1 have been collected from the ProwessIQ database and BSE website for the period from 31st March 2015 to 31st March 2021. Data relating to all variables were not available for all the firms, and therefore the sample came down to 32 firms with 224 observations.

#### 3.2 Model preference

The relationship between the CSR disclosure and firm performance is argued to bear the issue of endogeneity, as evident from the previous studies by Naseem *et al.* (2020), Pham and Tran (2020), Sial *et al.* (2018) and Jiang *et al.* (2021). Such a relation between the two results in inconsistent estimators, when OLS or fixed-effect model is applied in establishing the relation between CSR and firm performance (Baltagi and Baltagi, 2008). Also, the presence of heteroscedasticity and autocorrelation suggests that the application of the said model results in a weak model and thereby yields an inconsistent estimator. Therefore, the present study employed the dynamic panel model estimation proposed and developed by Arellano and Bover (1995) and Blundell and Bond (1998). Proceeding further to make the application of the dynamic panel more robust and also to identify the type of GMM model to be employed, the author followed Bond *et al.* (2001), which suggest that:



Source(s): Figure by authors

Figure 1.  
Assignment of  
dummy (1,0)

**Table 1.**  
Ratios used in  
the study

Ratio	Variable	Ratio definition
Firm Performance Ratios	Tobin's Q	Measures the assets of firms in relation to a firm's market value
Earnings Per Share	EPS	Company's net profit divided by the number of common shares it has outstanding
Book Value Per Share	BVPS	It is the ratio of equity available to common shareholders divided by the number of outstanding shares
Company Size	Size	Size of the company
Company Age	AGE	Current age of the firm, i.e. current year – incorporation year of the company
Dividend Per Share Ratio	DPS	Total dividends declared in a period divided by the number of outstanding ordinary shares issued by the company
Debt Equity Ratio	DER	It is a measure of the degree to which a company is financing its operations through debt versus wholly owned funds
Amount to be spent on CSR	ATCSR	Amount to be spent by company on CSR activities
Amount actually spent on CSR	ACSR	Amount actually spent by the company on CSR activities

**Source(s):** Author's compilation

- (1) The dynamic model should initially be estimated by employing the pooled OLS approach and fixed effects approach.
- (2) Of which the pooled OLS estimate for lagged-dependent coefficient should be taken as the upper-bound estimate, whereas the coefficient from fixed effects should be considered as the lower-bound estimate.
- (3) And finally the difference GMM estimate should be obtained and if the value of the estimate obtained is close/below the lower-bound estimate, then the system GMM estimator should be preferred over the difference GMM estimator.

Table 2 shows the estimates from the different dynamic models, where the upper bound is 0.423 (estimate of Pooled OLS) and 0.0395 (Pooled regression with fixed effect) is the-bound. Considering the estimates from one and two steps difference GMM, -0.1107 and 0.00585 respectively, which are below the lower-bound and hence the present study has employed the system GMM Model for establishing the quantitative relationship between CSR, ESG and firm performance.

### 3.3 Model specification

The present study employed a dynamic panel model as given below:

$$Y_{it} = \alpha_0 + \beta_0 Y_{i,t-1} + \beta_i X_{it} + \varnothing D_{it} + \varepsilon_{it} \quad (1)$$

**Table 2.**  
Estimates from  
different preferred  
Models

Model	Coefficient of lagged of dependent variables
Pooled Regression OLS	0.4235614(Upper-bound)
Pooled regression with fixed effect estimator	0.0395674 (Lower-bound)
One step difference GMM	-0.1107603
Two step difference GMM	0.0058592

**Source(s):** Author's calculation

Here,  $Y_{it}$  is the dependent variables namely Tobin's Q of each company  $i$  at time  $t$ , similarly,  $Y_{i,t-1}$  is the lagged value of each of the dependent variables for each company  $i$  at time  $t$ ;  $X_{it}$  is the independent variables namely ATCSR, ACSR and ESG Dummy and  $D_{it}$  is the other control variables namely size, age, DPS, DER, EPS and BVPS, which are supposed to affect the dependent variable.

### 3.4 GMM diagnostics

The consistency of the model is examined by two different tests, namely test for instrument validity and test for autocorrelation/serial correlation of the error term. The test for the validity of instrument is tested using the Hansen test, known as the test of over identifying restriction, whose null hypothesis is the overall validity of the instruments used. Failure to reject the null hypothesis gives support to the choice of the instruments. Secondly, the test for auto correlation/serial correlation of the error term is denoted by Arellano-Bond AR (2), whose null hypothesis is that the error term is not serially correlated. Failure to reject the null hypothesis of no second order serial correlation implies that the original error term is serially uncorrelated and the moment conditions are correctly specified (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998).

## 4. Data analysis and interpretation

### 4.1 Descriptive statistics

Descriptive statistics of all the independent and dependent variables are shown in Table 3 for 224 observations corresponding to 32 sampled firms from 2015 to 2021. Table 2 portrays the descriptive statistics of the entire variables: independent variables EPS, BVPS, Size, AGE, DPS, DER, ATCSR, ACSR dependent variable Tobin's Q of the firms constituting the BSE 100 Index for the period from 2015 to 2021. The table shows that the minimum value of Tobin's Q stays at 0.121 while the maximum value goes up to 20.361 with a standard deviation of 3.265 and a mean of 2.712. Similarly, the min value of the EPS remains at -151.49 with an upswing of 640.77 and the standard deviation and mean stand at 86.843 and 59.398, respectively. BVPS varies between 1.69 and 1358.8, with a standard deviation of 1028.07 and a mean of 469.199. The size varies between 9.241 and 15.64, with the least standard deviation of 1.297 and a mean of 12.419.

Similarly, the age ranged between 12 and 138 with a standard deviation and mean of 26.288 and 53, respectively. The min and max of DPS, and DER range between 0.2-40 and 0.01-38.53, respectively, with a standard deviation of 2348.98 and 3.033 and a mean of 173.871 and 1.216. On a similar note, the min value and the max value of the ATCSR and the ACSR stand at 30.4-8840 and 8-9220 with a standard deviation of 1315.843 and 1478.885, respectively, while the mean of

Variable	Obs	Mean	Std. Dev	Min	Max
TobinsQ	224	2.712	3.265	0.121	20.361
EPS	224	59.398	86.843	-151.49	640.77
BVPS	224	469.199	1028.07	1.69	1358.8
Size	224	12.419	1.297	9.241	15.64
AGE	224	53	26.288	12	138
DPS	224	173.871	2348.98	0.2	45
DER	224	1.216	3.033	0.01	38.53
ATCSR	224	816.342	1315.843	30.4	8840
ACSR	224	873.049	1478.885	8	9220

Source(s): Author's calculation

**Table 3.**  
Descriptive statistics

the two stands at 816.342 and 873.049. From this, it can be inferred that the variables except for Tobin's Q, size and DER have higher standard deviations, implying high variation, whereas ACSR has a higher mean and DER has the lowest mean.

Table 4 portrays the Pearson's pairwise correlation of all variables at a 5% significance level. Tobin's Q displays a negatively significant correlation with Size, DER, ATCSR and ACSR except for EPS. The variable EPS has shown a positive and significant correlation with BVPS but negative with Size, AGE and DER. Moreover, the variable BVPS was negatively correlated with AGE except for DPS. The size of the firm witnesses a significant positive correlation with DER, ATCSR and ACSR. However, Age depicts a relationship with DER that is not positive. DPS and ATCSR witness positive association with DER and ACSR, respectively.

Heteroskedasticity tests have been fitted to detect the presence of heteroskedasticity in the longitudinal data as these biases the standard errors and thus lead to ambiguous results. The Breusch-Pagan test is applied for all the variables to test the panel-level heteroskedasticity. The outcome of the test validates the existence of heteroskedasticity at the 5% level of significance, as shown in Table 5.

Testing for serial correlation has been done using the Wooldridge test in longitudinal data. The null hypothesis of the first-order autocorrelation is rejected for Tobin's Q. The results of the Wooldridge test are shown in Table 6.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) TobinsQ	1.000								
(2) EPS	0.385*** (0.000)	1.000							
(3) BVPS	-0.003 (0.959)	0.429*** (0.000)	1.000						
(4) Size	-0.602*** (0.000)	-0.191** (0.004)	-0.043 (0.522)	1.000					
(5) AGE	0.073 (0.278)	-0.209** (0.002)	-0.160** (0.017)	-0.074 (0.273)	1.000				
(6) DPS	-0.040 (0.553)	-0.006 (0.930)	0.859* (0.000)	-0.047 (0.484)	-0.107 (0.110)	1.000			
(7) DER	-0.183* (0.006)	-0.146** (0.029)	0.108 (0.108)	0.159** (0.017)	-0.235*** (0.000)	0.162** (0.015)	1.000		
(8) ATCSR	-0.220** (0.001)	-0.042 (0.532)	-0.010 (0.880)	0.687*** (0.000)	-0.050 (0.457)	-0.038 (0.574)	-0.038 (0.568)	1.000	
(9) ACSR	-0.225** (0.001)	-0.042 (0.528)	-0.008 (0.902)	0.687*** (0.000)	-0.012 (0.854)	-0.039 (0.561)	-0.049 (0.466)	0.974*** (0.000)	1.000

**Table 4.**  
Pair-wise correlations  
(2015–2021)

**Note(s):** \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$   
**Source(s):** Author's calculation

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity  
Ho: Constant variance  
Variables: fitted values of Tobin's Q  
 $\chi^2(1) = 86.92$   
Prob  $> \chi^2 = 0.00***$

**Table 5.**  
Heteroskedasticity test

**Note(s):** \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$   
**Source(s):** Author's calculation



**5. Dynamic panel regression (system GMM model)**

Table 7 presents the result of the dynamic model, where Tobin’s Q is dependent variables, ATCSR, ACSR and ESG dummy are independent variables and variables namely size, age, DPS, DER, EPS and BVPS are taken as control variables. From Table 6 it is seen that the lagged of the dependent variable is positive and significant, implying the positive impact of the same on the dependent variable. Among the independent variables ATCSR, ACSR and ESG dummy are positive; however, only ATCSR is significant at 10% significance level. This implies that the investors in India do consider CSR as an important factor while framing the investment strategies. This outcome of the present study is in line with Kansal and Joshi (2014), Mishra and Suar (2010) and contradicts with the studies by Garg *et al.* (2021), Oware and Iddrisu (2021), Bhattacharyya and Rahman (2020) and Fahad and Busru (2021). From this, it can be interpreted that the CSR does affect the stock market performance of a firm. Further from the dummy of ESG listed/unlisted firms, it is observed that the listing of firms under the ESG category does not significantly impact Tobin’s Q although a positive coefficient is witnessed, but its influence is witnessed to be insignificant. Similarly on observing the controlled variables it is seen that the AGE, DPS, EPS and BVPS are positive and significant implying the positive impact of the same on Tobin’s Q, however the coefficient of SIZE is negative and significant implying negative impact of the same.

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

$F(1, 31) = 0.037$

Prob > F = 0.8478

**Note(s):** \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Source(s):** Author’s calculation

**Table 6.**  
Wooldridge test

Tobin’s Q	Coef	p-value	Sig
Lagged Tobin’s Q	0.42	0.00	***
ATCSR	0.00	0.07	*
ACSR	0.00	0.44	
ESG Dummy	0.18	0.67	
SIZE	-0.98	0.00	***
AGE	0.01	0.10	*
DPS	0.00	0.01	**
DER	0.02	0.72	
EPS	0.02	0.00	***
BVPS	0.00	0.01	**
Constant	12.66	0.00	***
F-test	35.03	0.00	***
AR (1)	-0.53	0.59	
AR (2)	-1.57	0.11	
Sargan test	17.24	0.04	**
Hansen test	7.40	0.59	
Year Dummy		Yes	
Number of instruments		26	
Number of groups		32	
Number of observations		224	

**Note(s):** \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

**Source(s):** Author’s calculation

**Table 7.**  
Dynamic panel  
regression (system  
GMM model)

## 6. Robustness test and validity or results

The validity of the system GMM is confirmed to observe whether the model specification has been properly specified or not. Roodman (2009) says that the specified model should have a small number of instruments and from Table 7 it is witnessed that the number of instruments is less than that of groups and therefore in the present study the overspecification is avoided, i.e. the validity of the instruments is not biased and the model rejected the AR (1) that is the specification is correct. Secondly, the Hansen test also indicates a fit model power in explaining the dependent variables. Lastly, the AR (2) test shows that there does not exist second-order auto-correlation after the lagged of the dependent variable is introduced. Furthermore, the significant *F*-test also indicates the overall fit of the model. Thus, from this, it is obvious that the estimated model is satisfactorily specified and thus the outcomes are robust enough.

## 7. Conclusion

This paper focuses on ascertaining the influence of environmental factors like ESG and CSR on the stock market performance of firms forming the BSE 100 Index from 2015 to 2021. The study initially considered all the firms under the BSE 100 Index, but due to the nonavailability of data, the final sample has come down to 224 observations, constituting 32 firms. In the present study, dummy ESGs have been created based on the date of launch of the ESG; one (1) has been assigned to dates after the launch of the ESG and Zero (0) to dates prior to the announcement.

The independent variables which are used in the study were ATCSR, ACSR and ESG dummy, while the control variables were EPS, BVPS, Size, Age, DPS and DER. From the descriptive statistics, it is seen that the minimum value of Tobin's Q stays at 0.121 while the maximum value goes up to 20.361 with a standard deviation of 3.265 and mean of 2.712. On a similar note, the min value and the max value of the ATCSR and ACSR stand at 30.4–8840 and 8–9220, with a standard deviation of 1315.843 and 1478.885, respectively, while the mean of the two stands at 816.342 and 873.049. Further, Pearson's pair-pairwise reveals that there is a positive relationship of Tobin's Q with EPS; however, negative with Size, DER, ATCSR and ACSR. The size of the firms displayed a significant positive correlation with DER, ATCSR and ACSR. The Breusch-Pagan test for testing panel - level heteroskedasticity validated the existence of heteroskedasticity at the 5% level of significance. Considering the issue of endogeneity, presence of heteroscedasticity and autocorrelation and following Bond *et al.* (2001), the study considered employing system GMM for establishing the quantitative relationship between CSR, ESG and firm's performance. The study observed that that the investors in India do consider CSR as an important factor while framing the investment strategies; however, ESG listing as a factor is least preferred while framing the investment strategy. Among the control variables, AGE, DPS, EPS and BVPS has significant positive bearing on the firm's performance and SIZE has a significant negative impact on the firm's performance.

From the above analysis, it can be inferred that the investors in the Indian market do consider CSR factors while framing their investment strategies. While the firm's contribution toward protecting and preserving the environment and its stakeholders is least considered by the investors.

The study has at least three known drawbacks, the first of which is its limited time span, second the study was limited to the Bombay stock exchange's BSE 100 index, and third, more variables might have been included. Despite its limitations, the study adds to the literature on value relevance from the viewpoint of emerging economies and provides an understanding of the relationship between ESG, CSR and firm performance.

The findings of this study have many policy ramifications that stock market regulators and prospective investors can take into account. The study's conclusions can be applied

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generally to other firms or the Index in terms of ESG, CSR and firm performance. In order to get reliable results, future studies might possibly incorporate more variables and a group of variables forming an index.

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