Does Sustainability Performance Affect the Financial Performance of Indian Companies?

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Abstract

In this paper we examine the relationship between firm performance and sustainability performance of Indian companies. We look at accounting based measures of Return on assets (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE) and market based measure of Tobin's Q (Price to book Ratio) as firm performance measures and ESG (Environment, Social and Governance) scores for measure of sustainability performance. We control for other variables like size, leverage and risk and study the linear and non linear relationship between firm performance and sustainability performance of Indian companies. In this context, we present some new evidence for the India capital markets.

Keywords: *CSR Performance, ESG Scores, Firm Performance, Sustainability Performance*

I. INTRODUCTION

In the report 'From the stockholder to the stakeholder' (2015), the authors analyze and summarize about 200 studies and conclude that around 88% of the studies show that companies with sound ESG practices result in better financial performance and 80% of the studies show that sustainable companies also exhibit better stock price performance. Marks and Spencer which follows the Global Reporting Initiative (GRI) meticulously introduced 'Plan A' in 2007 to source responsibly, reduce food wastages and help transform communities, control emissions, recycling wherever possible, has helped it save $200million annually (From Stockholder to Stakeholder, 2015). A company can 'Do well by Doing good' has been clearly established in the recent times (David Vogel, 2005; Benabou and Tirole, 2010) and CSR helps both the company and the society prosper (Oliver Falck and Stephan Heblich, 2007). It can also be said that inferior ESG performance can negatively impact a company's reputation and ultimately the financial performance. Vedanta's reputation in India has grown over years as being violators of environmental and human rights regulations and several protests have been held during its existence in India even leading to ultimately shut down of its plant in Tuticorin, Tamil Nadu.[1]

CSR performance has positive consequences like improved accessibility to capital (Cheng et al. 2011), reduction in cost of capital, shareholder value maximization (Jensen, 2002), to improved Financial performance (Eccles, R.G., et al, 2014). Sustainability researchers agree that good quality ESG leads to enhanced reputation and competitive advantages (Porter and Kramer, 2006). We particularly focus on ESG or sustainability performance and its impact on Financial performance of Indian companies. We would like to study whether it is true for Indian companies that

[1] https://thewire.in/rights/tuticorin-sterlite-copper-plant-vedanta-modi-human-rights

sustainability and profitability are not at odds with each other rather investing in sustainability performance leads to higher Financial Performance.

The relationship between CSR performance[2] and firm performance has been extensively examined in the past globally and it can be said that there are have been mixed results on their relationship. We have discussed this in the literature review section. This is due to the fact that there are various opinions on the measurement of CSR performance (Watson, L., 2015) since CSR is concerned with both the contribution made to the society through the profits made as well the context in which the profits are earned. More precisely how a business impacts the Environment, Society and manages its corporate Governance to earn these profits. In India, as per provisions of The Companies Act, 2013, a company meeting certain thresholds is mandatorily required to spend a portion of its profits for the community while the Business Responsibility Report mandated by SEBI requires NSE 500 listed companies to make disclosures on ESG parameters in its Annual report.

In this paper, we test the relationship between Corporate sustainability performance (CSP) and both accounting and market based measures of Corporate Financial Performance (CFP). We measure CSP using the ESG performance score computed by Bloomberg. We make use of the accounting based measures such as Return on Assets (ROA), Return on Equity (ROE), Return on Capital employed (ROCE) and market based measure such as Tobin' s Q. We predict a negative relationship between the two variables, namely the CSP and CFP measures. The rest of the paper is organized as follows. Section 2 contains the Literature Review, Section 3 contains the Hypothesis and Model for testing, Section 4 contains the Data and

Methodology, Section 5 contains the Empirical Results and Section 6 contains the Conclusion.

II. LITERATURE REVIEW

The literature on the relationship between Corporate sustainability performance and Financial performance, it can be categorized into 3 types (Fernández- FeijóoSouto, 2009):

Positive– An in depth meta analysis of 167 studies by Margolis et al., (2009) covering a period of 1972 to 2007 uncovers a positive relationship between CSP and CFP for both accounting as well as market-based measures. Gregory, A et. Al (2016) by studying 43 industries finds that there is better earnings persistence in firms with higher CSP. Eccles, R.G., et al, (2014) establish better stock returns, ROA and ROE for high sustainability firms compared to the low sustainability firms while Luo and Bhattacharya (2006) establish the same with Tobin's Q and stock returns. CSP also improves reputation and brand value and helps firms attract high quality managers and employees which in turn leads to positive financial performance over the medium to long term (Bowman and Haire, 1975; Derwall et al. 2005; Herremans et al. 1993; Guerard 1997). CSP also has positive and bidirectional relationship with Sales revenue growth, ROA, PBT(profit before tax) and Cash From Operations (Ameer and Othman, 2012). Investing in CSR activities also gives a competitive edge to the firm which in turn can improve its CFP (Russo and Fouts, 1997). There are also many studies that conclude that there is a positive impact of CSP on CFP like McGuire (1988), Barney, (1991), Pava and Krausz (1996), Waddock and Graves (1997), Preston and Bannon (1997).

Negative - Some studies have also established a negative relationship between social performance and corporate financial performance and the major argument for this is that additional costs are incurred to improve social or environmental performance which does not contribute to enhancing shareholders' value (Aupperle et al., 1985,

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[2]We have used the terms CSR performance and corporate sustainability performance(CSP) interchangeably in this paper. Both refer to the performance of companies evaluated in Environment (E), Social (S) and Governance(G) parameters and the ESG score assigned to this performance by Bloomberg.

Bragdonand Marlin, 1972, Vance, 1975, Margolis and Walsh, 2003). Brammer S (2006)establish a negative relationship between CSP and stock returns while Makni et al. (2009) establish a negative relationship between the environmental dimension of CSP and ROA, ROE and market returns measures of CFP.

Neutral - A neutral view is one in which CSR researchers believe that CSR activities don't impact CFP since there could a large number of variables that intervene between the social responsibility performance and the financial performance of companies and it may not be possible to establish a direct relationship between the two (Ullmann, 1985). By introducing more variables such as the R&D strength in the model, the relationship between corporate financial performance and corporate social performance would disappear (McWilliams and Siegel, 2000). In many other studies establishing causality between the variables has not been possible (Schreck, 2011; Moore, 2001; Makni et al. (2009);Balatbat, 2012; Scholtens (2008); Siregar and Bachtiar (2010)).

The above studies mostly deal with the US or European markets and provide no evidence that there is a generic or universal business case for CSR. Hence, through our study, we aim to add to the existing literature by conceptualizing the current study to the Indian capital markets.

A. Research Gap

In the Indian context, high sustainability performance is found to have positive significant impact on ROA, ROE and Tobin's Q (Ghosh, 2013). High sustainability performance has been measured using the membership in S&P ESG India Index (this has been subsequently discontinued in 2013). This study focuses on top 200 NSE companies during 2009 to 2012 and uses random effect probit specifications and controls for variables like size, Leverage, Cash flows, R&D Intensity,

Advertisement expenditure, Industry effects, business group affiliation.

However, we can say that there are no studies in the Indian context that examine the direct relationship between Sustainability scores and Financial performance measures. We can say that this paper contributes to the literature in following ways – 1) It is the first to use ESG performance score computed by Bloomberg to measure ESG performance with respect to Indian companies. 2) It is the first to examine the direct relationship between performance score i.e. the quality of sustainability performance and financial performance of Indian firms rather than use an instrumental variable like membership in an Index 3) Lastly, it is the first to test the non-linear relationship between the two.

III. HYPOTHESES AND MODEL FOR TESTING

A. Hypotheses

Based on the identification of research gap in the above paragraphs with respect to the Indian markets, our study aims to test the following hypotheses.

i. Linear relationship between CSP and CFP at an aggregated level:

First, we would like to know whether corporate sustainability performance (CSP) is positively associated with the financial performance parameters (CFP). To test this hypothesis, we make use of the following linear regression equations:

Accounting based measures:

$$ROA_{it}/ROE_{it}/ROCE_{it} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 FSIZE_{i,t} + \beta_3 Lev_{i,t} + \beta_4 R\&DInt_{i,t} + \beta_5 IND_{i,t} + \varepsilon_{i,t} \quad (1)$$

Market based measure:

$$TobinsQ_{it} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 FSIZE_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Beta_{i,t} + \beta_5 EPS_{i,t} + \beta_6 R\&DInt_{i,t} + \beta_7 IND_{i,t} + \varepsilon_{i,t} \quad (2)$$

We predict a positive relationship between the CFP and CSP, where ESG variable stands for the ESG performance score and ROA, ROE, ROCE represents the various accounting measures for firm performance respectively, while Tobin's Q represents the market measure for firm performance. Here, variables $Lev, FSIZE, R\&DInt, Beta, EPS$ are the various control variables. The detailed definition of the variables is given later in this section. Here, *IND* stands for the industry dummy to control for variation across different industries. T is the time dummy to control for the time effects. It is to be noted that the same notations are used for variables for the rest of the paper as well.

ii. Nonlinear relationship between CSP and CFP

Sometimes, as we increase the investment in CSR activities, the CFP also improves but only up to a certain threshold. This is tested by investigating is there exists a non linear relationship between the two variables.

Accounting based measures:

$$ROA_{it}/ROE_{it}/ROCE_{it} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 ESG_{i,t}^2 + \beta_3 FSIZE_{i,t} + \beta_4 Lev_{i,t} + \beta_5 R\&DInt_{i,t} + \beta_6 IND_{i,t} + \varepsilon_{i,t} \text{ (3)}$$

Market based measure:

$$TobinsQ_{it} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 ESG_{i,t}^2 + \beta_3 FSIZE_{i,t} + \beta_4 Lev_{i,t} + \beta_6 Beta_{i,t} + \beta_7 EPS_{i,t} + \beta_8 R\&DInt_{i,t} + \beta_9 IND_{i,t} + \varepsilon_{i,t} \text{ (4)}$$

B. Model For Testing

Defining the Variables

Proxy for CSP: We have used ESG performance scores computed by Bloomberg from various sources apart from annual reports as a proxy for measuring the Corporate sustainability performance. This score is computed as a weighted average of E,S and G parameters. All the 3 parameters are given equal weightage of 33.33%. Computation of each of the components Environment, Social and Governance scores is a weighted average of their Value scores, deviation scores and policy scores. Each of these have their own number of metrics based on which the individual component scores are arrived at. Some of the metrics for the component of Environment include Climate risk, Resource efficiency and emissions while the Social component includes Human capital management, Health and safety and Supply chain whereas the Governance component includes Remuneration, Independence of Board, Audit, Shareholder rights, Diversity, entrenchment and overboarding. Each of these components have further sub categories and have weights assigned.

We have chosen this proxy as an alternate to the other third-party scores available for CSR performance primarily due to the lack of availability of globally recognized third party scores measuring CSR performance like KLD dataset[3] with respect to the Indian companies. Sources like CSRhub provide for only 150 companies from 2018 and even fewer companies for the earlier years. Also, as pointed out by Margolis et al (2009) many studies rely on 3rd party score like KLD data sets for testing such relationships, and hence an alternative proxy would be advisable.

While Artiach et al. (2010) talk about the superiority of using membership in sustainability indices as a proxy for measure of CSR performance over the other CSP variables like KLD ratings or content analysis of CSP disclosures, Moskowitz's reputation ratings or Fortune Magazine ratings. However in this chapter we are restrained from using Sustainability Index membership, since the S&P ESG India Index has been discontinued from October 2013 and an alternate Index of Nifty ESG

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[3]Kinder, Lydenberg, Domini and Co., Inc. They make available data sets with annual snap-shots of the environmental, social, and governance performance of companies rated by KLD Research & Analytics, Inc. KLD's research is distributed through Global Socrates, a proprietary database program that provides access to KLD's ratings and ESG data for 3000 publicly traded U.S. companies.

100 Index or Nifty Enhanced ESG 100 Index has been launched only in 2018. Hence, it would be too early to use membership in the ESG Index as an appropriate proxy for ESG performance.

Dependent and other control variables

Proxy for CFP: We have used alternative measures of financial performance as suggested by Griffin and Mahon (1997). Hence, we have used both accounting based measures (ROA, ROE and ROCE) as suggested by researchers like Ferrell, A., et. al, 2016; and market-based measure such as Tobin's Q. Tobin's Q has been measured as the Price to Book ratio. All the 4 variables have been obtained from prowess database.

Other Control Variables:

Variable	Mnemonics	Variable description
Size	Size	Natural logarithm of total assets
Risk	Risk	Beta
Leverage	Lev	Debt/Assets
R&D Intensity	R&DI	R&D expenses/Total assets (%)
Profit	EPS	Earnings per share
Industry	IND	10 dummies, one each for 10 Industries

We have adapted the Ohlson's model (Ghosh 2013; Andersen and Dejoy, 2011; Margolis et al., 2007;

McWilliams and Siegel, 2000) to test the relationship between CSP and CFP. We have also controlled for industry effects by introducing an industry dummy since distinguishing by industry type allows for clearer analysis to be made between CSR and financial performance (Chand, 2006).

IV. DATA AND METHODOLOGY

A. Data

The sample consists of NSE 500 listed companies for the period FY 2012 to FY 2018. CSP scores have been obtained from Bloomberg performance score card. The data for ROA, ROE, ROCE, Tobin's Q and other control variables have been obtained from Prowess database. We are dealing with a balanced panel containing data for 7 years, 501 firms leading to 3507 firm year observations. We have eliminated all missing data and the final count of observations have been reported in the tables under the empirical section for each regression equation.

B. Methodology

From the below table we can see that the average ESG scores have increased over the years consistently for all the industries except for FY 2018 where it has fallen for all the industries. While the energy and the technology sectors seem to be having the highest scores while the health care sector and the financial institutions seem to be in the lowest category.

Table 1A showing Industry wise year wise mean ESG scores at aggregate level

Industry	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Average
Communications	15.36	18.59	20.51	20.56	23.93	25.23	24.89	21.30
Consumer Discretionary	11.99	15.15	16.45	18.33	19.80	17.98	13.98	16.24
Consumer Staples	14.30	16.14	20.75	21.20	23.64	23.80	20.56	20.05
Energy	23.67	37.18	39.04	40.60	40.93	37.14	27.12	35.10

Industry	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	Average
Financials	10.86	15.23	17.35	19.10	22.48	22.00	20.85	18.27
Health Care	12.77	15.76	17.60	19.30	21.84	23.41	18.99	18.52
Industrials	13.83	18.69	21.07	22.38	25.28	23.73	20.36	20.76
Materials	20.44	25.53	28.57	30.15	32.85	26.92	20.65	26.44
Technology	22.33	26.53	28.96	31.13	32.49	32.85	26.54	28.69
Utilities	15.07	19.69	22.05	23.74	27.36	26.96	21.17	22.29
Year wise average	**14.83**	**19.12**	**21.48**	**23.02**	**25.57**	**24.01**	**20.04**	**21.15**

Table 1B provides the summary statistics of the key variables only.

Table 1B: Summary Statistics of the key variable:

Statistics	RONW	ROCE	ROA	Tobin's Q	ESG
Mean	14.46278	9.859449	6.893399	3.978843	28.27032
P50	13.32	8.12	5.17	2.34	22.17933
Min	-996.99	-2055.26	-142.7	0	1.515152
Max	1250.73	182.09	115.83	277.23	89.39865
Stddev	39.41062	43.65909	9.643767	8.447579	16.77345
skewness	4.596417	-37.08858	-1.815032	18.30929	1.410786
Kurtosis	494.4325	1647.067	50.5549	508.60627	4.554666
N	3283	3283	3283	3283	2552

Source: Calculation by authors

Note: N is the total number of observations

The mean ESG score is 28.27 with a standard deviation of 16.77. The average Tobin's Q is 3.98 with a standard deviation of 8.44. The mean RONW, ROCE and ROA are 14.46, 9.86 and 6.89 respectively. All the variables except ROCE, ROA and Governance scores are positively skewed and follow a leptokurtic distribution. Hence, we can say that the variables do not follow a normal distribution.

Table 1C: Correlations

	ROE	ROCE	ROA	Size	RD	EPS	Risk	Lev	ESG Score	PB
ROE	1.000									
ROCE	0.1791**	1.000								
ROA	0.3998**	0.5420**	1.000							
Size	-0.1267**	-0.0218	-0.1812**	1.000						

RD	-0.0317*	-0.4166**	-0.1666**	-0.0820**	1.000					
EPS	0.0961**	0.0380**	0.0793**	-0.0076	-0.0029	1.000				
Risk	-0.1654**	-0.0635**	-0.2055**	0.3459**	-0.0005	-0.0670**	1.000			
Lev	-0.0918**	-0.1745**	-0.3097**	0.1341**	-0.0176	0.0065	0.0855**	1.000		
ESG Score	0.0311	0.0718**	0.0991**	0.3965**	-0.0378*	-0.0255	-0.0413**	0.0302	1.0000	
PB	0.0859**	0.0664**	0.1167**	-0.0581**	0.0706**	-0.0149	-0.0433**	-0.1209**	0.0312	1.000

Source: Calculation by the authors

*Note: ** and * denotes significance at 5% and 10% respectively*

We can see that, ESG score is positively and significantly correlated with ROCE, ROA. Even though there is positive correlation between ESG score and PB as well as ROE and ESG score, the correlation coefficient is not significant. Further, ESG score is positive and significantly correlated with size, while negatively correlated with RD, EPS and Risk, measured by beta. Firm performance measure PB, ROE, ROCE and ROA have a significant positive correlation with one another. Size, Risk, RD and Lev have a negative correlation with these measures, while EPS has a positive correlation with the CFP measures.

V. EMPIRICAL RESULTS

In this section, we provide the results of the empirical analysis undertaken at various levels. Here, have tested the hypotheses detailed in Section 3 using a panel regression model.

In the various tables given below, the key explanatory variables are ESG score (ESG). The dependent variables are ROA, ROE, ROCE that represents the various accounting measures for firm performance respectively, while Tobin's Q represents the market measure for firm performance. The other firm level control variables are $Lev, FSIZE, R\&DInt$, *Beta, EPS*. Here, *IND* stands for the industry dummy to control for variation across different industries. Time effects are controlled using time dummies. The standard errors are clustered at firm level

Here, we want to study the linear relationship existing between CSP score and firm performance. For this, we make use of the aggregated ESG score. Here, we consider only those firms that are scored by Bloomberg. Here, the standard errors are clustered at firm level resulting in 382 clusters. Table 2 provides the results of regression equations (1)-(2).

i. *Linear relationship between CSP and CFP at an aggregated level:*

Here, we want to study the linear relationship existing between CSP score and firm performance. For this, we make use of the aggregated ESG score. Here, we consider only those firms that are scored

by Bloomberg. Here, the standard errors are clustered at firm level resulting in 382 clusters.

Table 2 provides the results of regression equations (1)-(2).

Table-2: Linear relationship between CSP and CFP

	ROA	ROE	ROCE	Tobin's Q
ESG	.0942957**(.0186458)	.197981**(.0560522)	.1427535**(.0294136)	.0442732** (.010313)
Size	-1.317719**(.2115541)	-2.427934**(.8017998)	-1.734409**(.340589)	-.8660454** (.2919955)
Lev	-13.48495**(2.049977)	-20.0843*(11.54298)	-26.15261**(3.53932)	-3.12535** (1.11167)
R&DI	-2.640928**(.0567855)	-2.411767**(.2982822)	-29.14291**(.4519689)	.5085273** (.1270385)
EPS				-.0001466* (.0000807)
Beta				-1.563762** (.5929412)
_cons	19.62233**(3.095547)	29.56934**(9.472031)	25.58858**(4.429035)	16.48065** (3.223309)
Adj R^2	0.2975	0.03	0.7096	0.1382
N	2549	2549	2549	2542

Source: Calculation by authors

*Notes: ** and * are significance at 5% and 10%significance level*

From the table, we can see that, ESG scores in total, positively impacts firm performance as evidenced by a significant positive coefficient for ROA, ROE, ROCE and Tobin's Q respectively. Further, size, leverage and R&DI have a significant negative impact on firm performance. EPS and beta have a significant negative impact on the price to book ratio as measured by Tobin's Q of a firm. Therefore, one can conclude that the ESG score as a whole has a positive linear relationship with both accounting as well as market measures of firm performance.

ii. Nonlinear relationship between CSP and CFP

In order to test the curvilinear relationship between CSP and CFP, we test the equations (3-4). Here, we add a variable ESG^2 which is simply the square of ESG variable. Once again, Firm effects and time effects are controlled for in the regression model. The standard errors are clustered at firm level resulting in 381 and 382 clusters respectively for accounting and market measures respectively. The estimation results are presented in Table 5.

Table-3: Nonlinear relationship between CSP and CFP

	ROA	ROE	ROCE	Tobin's Q
ESG	.2011716** (.0616835)	.4147425** (.1864127)	.3556886** (.1143395)	.1756228** (.0410117)
ESG2	-.001312* (.0007203)	-.0026609 (.0019385)	-.002614** (.0012505)	-.001611** (.0004702)
Size	-1.334247** (.2124836)	-2.461456* (.8062838)	-1.767339** (.3418744)	-.8878307** (.2896373)

Lev	-13.67817** (2.054106)	-20.47619* (11.52639)	-26.53759** (3.573145)	-3.369634** (1.094793)
R&DI	-2.612153** (.0582539)	-2.353406** (.2989752)	-29.08558** (.4604611)	.5437334** (.1304446)
EPS				-.0001055** .(0000754)
Beta				-1.557035** (.5892332)
_cons	18.16529** (3.08875)	26.61422** (9.639155)	22.68563** (4.518255)	14.69697** (3.262885)
Adj R^2	0.3002	0.0305	0.7108	0.1437
N	2549	2549	2549	2542

Source: Calculation by authors

*Notes: ** and * are significant at 5% and 10% respectively.*

Values in bracket denotes the robust standard errors

The estimation results posit a very interesting picture. The quadratic term for ESG (ESG2) is negative and statistically significant for all indicators of firm performance measures, except for ROE, where as the ESG term is positive and significant. This suggests a strong evidence of existence of a curvilinear relationship between ESG performance score and firm performance. The relationship takes form of an inverted U-shape, suggesting that, upto a certain point, investing in activities that can increase the ESG scores does reap benefits in the form of superior firm performance. After a threshold level, the costs of such activities exceed the benefits and hence, higher ESG score beyond this threshold may not lead to increase in Financial performance. This conclusion is of immense help to corporates as it suggests that, after a level, costs relating to ESG could be counter-productive.

VI. ENDOGENEITY CONTROLS

A. Methodology

In this section, we use the two stage least squares method (2SLS) to circumvent the issue of potential endogeneity in our baseline model. Endogeneity problem would exist if there is a reverse causality between corporate sustainability performance (CSP) and financial performance parameters (CFP) i.e. if firms with superior financial performance tend to spend more on CSR and thereby outperform in terms of CSP.

Therefore, to circumvent this issue, we employ the following 2SLS model as follows using instrumental variable approach to examine the effect of CSP on CFP.

i. CSP and CFP

Similar to the base line model wherein we test this linear relationship at the aggregated level, in this section we run the 2SLS model to study CSP scores and its impact on CFP.

The first stage is modelled as below:

Accounting based measures

$$ESG_{i,t} = \alpha_0 + \alpha_1 \Delta ESG_{i,t-1} + \alpha_2 \Delta MedS_{i,t} + \alpha_3 FSIZE_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 R\&DInt_{i,t} + e_{i,t}$$

(5)

Market based measure

$$ESG_{i,t} = \alpha_0 + \alpha_1 \Delta ESG_{i,t-1} + \alpha_2 \Delta MedS_{i,t} + \alpha_3 FSIZEi,t + \alpha_4 LEV_{i,t} + \alpha_5 R\&DInti,t + \alpha_6 Beta_{i,t} + \alpha_7 EPS_{i,t} + e_{i,t}(6)$$

The second stage is modelled as below:

Accounting based measures

$$ROA_{it} / ROE_{it} / ROCE_{it} = \alpha_0 + \alpha_1 \Delta \widehat{ESG}_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 FSIZE_{i,t} + \alpha_4 R\&D_{i,t} + u_{i,t} \quad (7)$$

Market based measure

$$TobinsQ_{it} = \alpha_0 + \alpha_1 \Delta \widehat{ESG}_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 FSIZE_{i,t} + \alpha_4 R\&D_{i,t} + u_{i,t} \quad (8)$$

As in the baseline model, ESG is the explanatory variables and our proxy for CFP will be analyzed from accounting and market based measures point of view. In both the parts, in the first stage, we regress ESG on multiple instrumental variables like year wise median ESG scores differentials, one period lagged ESG differentials. In the second stage, we use the predicted values estimated from the first stage and run the regressions. We estimate the Hausman test (general version) to test the consistency of the OLS estimator. We also compute the Sargan over identification test statistic.

B. Empirical Results

a. We run a 2 stage least square regression using year wise median ESG scores differentials, one period lagged ESG differentials as two instrumental variables to study the impact of CSP on CFP . We are not reporting the first stage results here.

Table 4: Impact of CSP on CFP using a 2SLS model

	ROA	ROE	ROCE	Tobin's Q
ESG	.04682 (.0513662)**	-.2751619 (.2260443)	.0700731 .(.0842639)*	**.0720353 (.0297108)****
Size	-.8980917 (.1989373)**	.2970805 (.8754512)	-1.216795 .(.3263474)**	**-.3765064 (.1243479)****
Lev	-1.482465 (.1866057) **	-7.560328 (.8211844)**	-2.484609 (.306118)**	**-4.880717 (.8789403)****
R&DI	**1.178073 (1.865474)**	1.249504 (8.209279)	-.0215602 (3.060224)	**.3044184 (.157343)****
EPS				**-.000187 (.0001974)**
Beta				**-1.969701 (.3299798)****
_cons	**15.50457 (1.085392)****	**20.81445 (4.776417)****	**22.47309 (1.780535)****	**8.418309 (.6381511)****
Adj R^2	**0.1113**	**0.0311**	**0.0957**	**0.0632**
N	**1593**	**1593**	**1593**	**2023**

Source: Calculation by authors

*Notes: ** and * are significance at 5% and 10%significance level.*

Values in bracket denotes the robust standard errors

We can see that ESG scores have a positive and significant impact on ROA, ROCE and Tobin's Q as also validated by the OLS regression. ROE does not seem to be get impacted by superior ESG scores.

b. Now we compute the general version of the Hausman test statistic. The null hypothesis is that the OLS estimator is consistent.

Table 5: Impact of CSP on CFP using a OLS

	ROA	ROE	ROCE	Tobin's Q
ESG	. .1094084 (.0100542)**	.1690767 (.0515708)**	.1738787 (.0190552)**	**.0298066 (.0093368)**
Size	-1.272561 (.0806847)**	-1.992651 (.4138536)**	-2.229491 (.1529172)**	**-.3305534 (.0785028)**
Lev	-1.467953 (.153527)**	-6.063417 (.787481)**	-2.452567 (.290971)**	**-5.428605 (.9877846)**
R&DI	**-2.574909 (.2144804)**	-1.993795 (1.100127)**	-28.91088 (0.4064924)**	**.5371235 (.1958521)**
EPS				**-.0002043 (.0002392)**
Beta				**-1.996548 (.3204912)**
_cons	**17.9698 (.7908858)**	**31.69465 (4.056664)**	**30.99017 (1.498921)**	**9.592742 (.7258262)**
Adj R^2	**0.1746**	**0.0369**	**0.6739**	**0.0559**
N	**2552**	**2552**	**2552**	**2545**

Source: Calculation by authors

*Notes: ** and * are significance at 5% and 10%significance level.*

Values in bracket denotes the robust standard errors

Here, we run an OLS in order to compute the Hausman test statistic and we again find that the ESG score is significant & positively impacting firm performance based on both accounting and market based performance measures.

Now we compute the Hausman test statistic for this OLS regression.

Table 6: Impact of CSP on CFP using a OLS

	ROA	ROE	ROCE	Tobin's Q
Chi^2 value	23.75	19.32	100.97	**585.42**
p-	0.000	0.000	0.000	**0.000**

value				

Source: Calculation by authors

From the hausman test, we can see that the p-value for the chi2 test statistic is significant at 5% level and hence we can reject the null that OLS estimator is consistent.

c. overidentification test **

Table 7: Sargan test results

	ROA	ROE	ROCE	Tobin's Q
Sargan test stat	3.51	**.968**	0.317	**8.706**
p-value	0.06	0.324	0.572	**0.0031**

Source: Calculation by authors

The uncentred R-square of the above regression will be computed below to produce the overidentification test statistic, also known as the Sargan statistic. Here we fail to reject the hypothesis that the instrumental variables are exogenous and hence our model is correctly specified when we use ROE and ROCE as proxies for firm performance as the p-value is not significant.

VII. CONCLUSION

From the empirical work carried out, we can conclude that there is a significant positive relationship between ESG scores (CSP) and the CFP measures of ROA, ROE, ROCE and Tobin's Q. This is a very significant finding and helps us to conclude that sustainability performance has significant positive impact on the Financial performance of Indian companies.

At the next level, we test the nonlinear relationship between ESG(CSP) score and CFP measures. The quadratic term for ESG (ESG2) is negative and statistically significant for all indicators of firm measures, except for ROE, whereas the ESG term is positive and significant across all indicators of firm performance. This suggests a strong evidence of existence of a curvilinear relationship between ESG performance score and firm performance. The relationship takes form of an inverted U-shape, suggesting that, up to a certain point increase in ESG score leads to an increase in Financial performance. After a threshold level, the costs of such activities exceed the benefits and hence, higher ESG score beyond this threshold does not cause an increase in financial performance, rather may decrease it.

The results from the tests conducted in this chapter should motivate corporates to start focusing on ESG activities and disclosure aspects in their sustainability reports to reap benefits. Results can be an encouragement for even those companies which are not mandatorily required to publish Business responsibility reports to start voluntarily disclosing ESG information since it enhances the Firm Financial performance.

We can say in conclusion that these results indicate to us that effectively and responsibly managing the activities of the business can enhance the corporate financial performance and ultimately shareholder value. Further based the curvilinear relationship between ESG performance score and firm performance, we can say that the ESG scores help improve the firm performance to a certain upto a threshold and beyond this threshold an increase in ESG scores do not cause increase in firm performance

REFERENCES

[1] Ameer, R. and Othman, R., 2012. Sustainability practices and corporate financial performance: A study based on the top global corporations. Journal of Business Ethics, 108(1), pp.61-79.

[2] Andersen, M.L. and Dejoy, J.S., 2011. Corporate social and financial performance: the role of size, industry, risk, R&D and

advertising expenses as control variables. Business and Society Review, 116(2), pp.237-256.

[3] Artiach, T., Lee, D., Nelson, D. and Walker, J., 2010. The determinants of corporate sustainability performance. Accounting & Finance, 50(1), pp.31-51.

[4] Aupperle, K.E., Carroll, A.B. and Hatfield, J.D., 1985. An empirical examination of the relationship between corporate social responsibility and profitability. Academy of management Journal, 28(2), pp.446-463.

[5] Balatbat, M., Siew, R. and Carmichael, D., 2012. ESG scores and its influence on firm performance: Australian evidence. In Australian School of Business School of Accounting, School of Accounting Seminar Series Semester (Vol. 2).

[6] Barney, J., 1991. Firm resources and sustained competitive advantage. Journal of management, 17(1), pp.99-120.

[7] Bénabou, Roland, and Jean Tirole. "Individual and corporate social responsibility." Economica 77.305 (2010): 1-19.

[8] Bowman, E.H. and Haire, M., 1975. A strategic posture toward corporate social responsibility. California management review, 18(2), pp.49-58.

[9] Bragdon, J.H. and Marlin, J., 1972. Is pollution profitable. Risk management, 19(4), pp.9-18.

[10] Brammer, S., Brooks, C. and Pavelin, S., 2006. Corporate social performance and stock returns: UK evidence from disaggregate measures. Financial management, 35(3), pp.97-116.

[11] Chand, Masud, and S. Fraser. "The relationship between corporate social performance and corporate financial performance: Industry type as a boundary condition." The Business Review 5.1 (2006): 240-245.

[12] Cheng, Beiting, Ioannis Ioannou, and George Serafeim. "Corporate social responsibility and access to finance." Strategic management journal 35.1 (2014): 1-23.

[13] Clark, Gordon L., Andreas Feiner, and Michael Viehs. "From the stockholder to the stakeholder: How sustainability can drive financial outperformance." Available at SSRN 2508281 (2015).

[14] Vogel, David J. "Is there a market for virtue?: The business case for corporate social responsibility." California management review 47.4 (2005): 19-45.

[15] Derwall, J., Guenster, N., Bauer, R. and Koedijk, K., 2005. The eco-efficiency premium puzzle. Financial Analysts Journal, pp.51-63.

[16] Eccles, R.G., Ioannou, I. and Serafeim, G., 2014. The impact of corporate sustainability on organizational processes and performance. Management Science, 60(11), pp.2835-2857.

[17] Souto, B.F.F., 2009. Crisis and corporate social responsibility: threat or opportunity?. International Journal of Economic Sciences and Applied Research, 2(1), pp.36-50.

[18] Ghosh, Arpita. "Corporate sustainability and corporate financial performance: The Indian context." Indian Institute of Management Calcutta: Working Paper Series 721 (2013): 1-37.

[19] Gregory, Alan, Julie Whittaker, and Xiaojuan Yan. "Corporate social performance, competitive advantage, earnings persistence and firm value." Journal of Business Finance & Accounting 43.1-2 (2016): 3-30.

[20] Guerard Jr, J.B., 1997. Is there a cost to being socially responsible in investing?. Journal of forecasting, 16(7), pp.475-490.

[21] Herremans, I.M., Akathaporn, P. and McInnes, M., 1993. An investigation of corporate social responsibility reputation and economic performance. Accounting, organizations and society, 18(7-8), pp.587-604.

[22] Jensen, Michael C. "Value maximization, stakeholder theory, and the corporate objective function." Business ethics quarterly (2002): 235-256.

[23] Luo, X. and Bhattacharya, C.B., 2006. Corporate social responsibility, customer

satisfaction, and market value. Journal of marketing, 70(4), pp.1-18.

[24] Makni, R., Francoeur, C. and Bellavance, F., 2009. Causality between corporate social performance and financial performance: Evidence from Canadian firms. Journal of Business Ethics, 89(3), p.409.

[25] Margolis, Joshua D., and James P. Walsh. "Misery loves companies: Rethinking social initiatives by business." Administrative science quarterly 48.2 (2003): 268-305.

[26] Margolis, J.D., Elfenbein, H.A. and Walsh, J.P., 2007. Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social and financial performance. Ann Arbor, 1001, pp.48109-1234.

[27] Margolis, Joshua D., Hillary Anger Elfenbein, and James P. Walsh. "Does it pay to be good... and does it matter? A meta-analysis of the relationship between corporate social and financial performance." And does it matter (2009).

[28] McGuire, J.B., Sundgren, A. and Schneeweis, T., 1988. Corporate social responsibility and firm financial performance. Academy of management Journal, 31(4), pp.854-872.

[29] McWilliams, A. and Siegel, D., 2000. Corporate social responsibility and financial performance: correlation or misspecification?. Strategic management journal, 21(5), pp.603-609.

[30] Moore, Geoff. "Corporate social and financial performance: An investigation in the UK supermarket industry." Journal of Business ethics 34.3-4 (2001): 299-315.

[31] Falck, Oliver, and Stephan Heblich. "Corporate social responsibility: Doing well by doing good." Business Horizons 50.3 (2007): 247-254.

[32] Pava, M.L. and Krausz, J., 1996. The association between corporate social-responsibility and financial performance: The paradox of social cost. Journal of business Ethics, 15(3), pp.321-357.

[33] Porter, Michael E., and Mark R. Kramer. "The link between competitive advantage and corporate social responsibility." Harvard business review 84.12 (2006): 78-92.

[34] Preston, L.E. and O'bannon, D.P., 1997. The corporate social-financial performance relationship: A typology and analysis. Business & Society, 36(4), pp.419-429.

[35] Russo, M.V. and Fouts, P.A., 1997. A resource-based perspective on corporate environmental performance and profitability. Academy of management Journal, 40(3), pp.534-559.

[36] Galema, R., Plantinga, A. and Scholtens, B., 2008. The stocks at stake: Return and risk in socially responsible investment. Journal of Banking & Finance, 32(12), pp.2646-2654.

[37] Schreck, P., 2011. Reviewing the business case for corporate social responsibility: New evidence and analysis. Journal of Business Ethics, 103(2), p.167.

[38] Ullmann, Arieh A. "Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance of US firms." Academy of management review 10.3 (1985): 540-557.

[39] Vance, Stanley C. "Are socially responsible corporations good investment risks." Management review 64.8 (1975): 19-24.

[40] Veronica Siregar, S. and Bachtiar, Y., 2010. Corporate social reporting: empirical evidence from Indonesia Stock Exchange. International Journal of Islamic and Middle Eastern Finance and Management, 3(3), pp.241-252.

[41] Waddock, S.A. and Graves, S.B., 1997. The corporate social performance–financial performance link. Strategic management journal, 18(4), pp.303-319.

[42] Watson, Luke. "Corporate social responsibility research in accounting." Journal of Accounting Literature 34 (2015): 1-16.