

The Impact Of ESG Techniques On ROIC And EPS For Manufacturing Firms: Research From Listed Companies In India

Ridhi Kalani¹, Dr. Anirban Sengupta², Dr. Manish Didwania³

Abstract

Companies that are publicly traded worldwide are shifting their focus away from maximizing short-term profits to achieving long-term environmental, social, and governance (ESG) objectives. The growing importance of environmental sustainability concerns is now recognized by most business leaders. They have started to believe that an organization's financial health and reputation in the marketplace may be affected by this. A study recently concluded that companies that have strong ESG performance may be able to enhance their financial performance. The question of how ESG affects financial performance has received little attention in India. Our study examines the link between ESG operations and financial indices in India's publicly traded firms by analyzing dynamic and static panel data. Our initial step is to gather financial data from Bloomberg and preprocess it using descriptive statistics. The consequence of ESG variables on the financial performance of the manufacturing companies during 2018 to 2022 was investigated. The analysis was done based on 701 BSE manufacturing companies' year-wise data. The independent variable is the ESG scores; the dependent variables are performance indicators, i.e., Return on Invested Capital (ROIC) and Earnings per share (EPS). The control variable that is employed: Firm size.

The empirical findings indicate that ESG doesn't have a substantial positive impact on performance. However, the relationship between ESG disclosures do vary if measured individually; the disclosures are found putting positive effect on ROIC but EPS.

Financial performance may be improved through ESG activities, which could have an impact on investors, business administrators, decision-makers, and industry regulations.

Keywords: ESG, Financial Performance, ROIC, EPS, manufacturing, BSE 500.

Introduction

The focus of decision makers and various other stakeholders has changed throughout history, currently it is set on the global agenda. It is imperative that they realize that their focus and attention has irreversibly shifted away. One of the special issues on the agenda of the interest groups is sustainable development. Building and maintaining trusting relationships with various stakeholders is critical for companies seeking competitive advantage (Rahi et al., 2022). One can rightly believe that "ESG" is the right answer to questions related to the realization of "sustainable development". In addition to the three-dimensional (E, S and G) criteria, the ESG agenda includes many other aspects. Unlike CSR, ESG places more emphasis on an organization's ability to develop and sustain long-term value in a rapidly changing world, as well as the opportunities and threats associated

¹(Research Scholar, SOB, Mody University of science and Technology)

²(Professor and Dean, SOB, Mody University of science and Technology)

³(Controller of Examinations, Central University of Rajasthan)

with these changes. The complex ESG agenda is at the centre of today's key investment criteria, the attention of companies and the interests of various industries, authorities and all stakeholders is towards it. In addition to the considerable amount of work involved, defining ESG requires focus. ESG can be considered a comprehensive concept that encompasses all environmental, social and management aspects. This is one interpretation of the sentence but if you do a web search, you won't find a definition that most people agree on. Investing that emphasizes environmental, social and governance factors has many names, each of which means something different to different people. For example, "socially responsible investment", "sustainable investment" and "responsible investment" are examples of phrases that are often used in this context (Agency for Investments and Competitiveness, 2014). The three are sometimes distinguished, but the distinctions are inconsistent. Environmental parameters take into account the environmental effects and psychological sustainability of the company's activities. According to the social aspects, the company must manage relationships with stakeholders and create value for them. The term "Management criteria" refers to the management and control ideas, methods and internal control of the company, as well as the rights of the shareholders. (Egorova et al., 2021) The ESG concept has an impact on both investment activities and financial markets. In today's economy, socially or environmentally responsible investing has become more common. There is a trend in today's economy, and one of them is the increase in investor interest. Investor interest in ESG-compliant companies has increased due to their better sustainability, long-term growth resources and operational optimization. In addition, several studies support the claim that companies with high ESG ratings do better financially. (Khemir et al., 2019) In emerging markets, companies are increasingly disclosing environmental, social and governance (ESG) information in addition to financial reporting. Investing that emphasizes environmental, social and governance factors has many names, each of which can mean differently to different people. (CFI team, 2022). A company's "financial results" show or are intended to represent what happened in the company's core business over a period of time. They are a comprehensive study of a company's position in a number of different areas, including assets, liabilities, equity, expenses, income and overall profit. In other words, a financial statement is a snapshot of a company's financial position. It is estimated using several separate company-specific equations, and these formulas allow users to generate accurate information about a company's potential performance. Users of a company's intranet evaluate both the company's overall health and its position in the industry by looking at various benchmarks, including the company's financial performance. The purpose of the analysis of the company's financial results is to provide useful information to external users. These users are interested in learning about potential investment opportunities and deciding whether or not the company is a service for them. A review of the company's annual accounts must be done before making calculations of certain financial indicators describing the company's overall performance. (CFI Team, 2022). This study consists of the following parts: After the introduction in Section 1, this study is divided into four more parts. The second part contains a literature review. The design and methodology of the study is described in part 3, where BSE 500 manufacturing companies were the sample and descriptive statistics and other statistical tools were applied to the data in the fourth part Chapter 5 contains conclusions, suggestions and future research directions.

Review of Literature

The link between ESG and financial success has been the subject of conflicting findings in earlier research.

The topic has sparked intense discussions among scholars; the literature to date is ambiguous. Positive, negative, and neutral relationships between two conceptions are the prevalent viewpoints.

Qudah (2021); Sultana (2018); Xie (2019) concluded that 'E' (Environment) in ESG information contains environmental dimensions such as pollution, loss of biodiversity, emissions of greenhouse gas, waste management, renewable energy, energy efficiency; 'S' contains social dimensions such as standard of living, well-being, gender diversity, justice, employee retentions and workforce management; 'G' contains governance dimensions such as internal control, schedules, board, diverseness, sovereignty, clarity of information and risk control.

Fatihudin and Mochklas (2018) put forth that FP includes a firm's financial accomplishment for a specific period studied by such factors as capital sufficiency, efficiency, solvency, profitability, liquidity and leverage.

Osadume and Okene (2021) aimed to find out if sustainability practices in the financial sector had a correlation with the financial performance of the sector in Nigeria to provide Policy directions using published financial statements of the banks from 2010 to 2019 of Nigerian banks and found that there is the impact of sustainability practices of the financial sector on ROA and ROE in the short run but no impact was found in long run.

Jha and Rangarajan (2020) chose a representative sampling of the top 500 Indian companies from 2008 to 2018 to find the link between Corporate Sustainability Practices (CSP) and Corporate Financial Performance (CFP) considering ESG at accumulated and individual levels. Assessment of CFP has been found in both accounting and market-based measures. Panel data was examined using the Granger causality test and multiple regression and discovered CSP- CFP relationship is mainly trivial for Indian firms in totality but individually, a negative alliance was found.

Bradford, Earp and Williams (2017) attempted to determine types of sustainability activities reported by companies and the understandability of external people towards such reports in correspondence to narratives of companies towards sustainability through a sample of sustainability reports prepared by GRI is Global Reporting Initiative guidelines and found that the dimensions employed by the subjects differed in some significant ways from those dimensions used to construct the GRI format. Subjects evaluated sustainability efforts as primary efforts of being a good citizen with sustainability an end in itself rather than as a constraint to be respected in achieving profitability goals.

Siew, Balatbat and Carmichael (2013) aimed to explore the impact of ESG reporting on FP of publicly-listed Australian construction companies examined their condition of non-financial detailing on climate change, environmental status, environmental productivity, health and welfare, human assets, performance, stakeholder commitment, administration, etc, and studied the effect of emanating non-financial reports and degree of companies' sustainability exercise (represented by ESG scores) on the FP of companies. Using the variety of financial ratios, low levels of reporting from companies were found. Also, the relationship between FP and ESG scores is found to be not so strong.

Plumlee (2015) explained how corporations obtain legitimacy by purposefully sharing ESG knowledge that elucidates how their actions influence the public and the environment, as well as the measures put in place to minimise the negative consequences of their activities.

Matuszak and Rozanska (2017) asked about the relationship between social concern findings and the financial management of Polish companies The authors identified a negative correlation between the banks' social responsibility disclosures and their Net Interest Margin (NIM), indicating that the banks with more social updates fared worse.

Buallay (2019) investigated the relationship between ESG reporting and bank performance in Europe and discovered that social responsibility reporting had a strong negative impact on banks' return on assets (ROA), return on equity (ROE), and Tobin's Q. This research also suggests that ESG reporting harms bank financial performance.

Dhaimesh and Zobi (2019) performed a study in Jordan and discovered that environmental disclosure did not affect bank performance, however, aggregate ESG reporting had a considerable beneficial influence on bank financial performance.

Matemane and Wentzel (2019) in their research, investigated the impact of integrated reporting on the financial operations of Johannesburg Stock Exchange-listed banks. The researchers discovered no link between integrated reporting and bank performance as measured by ROE, ROA, and Tobin's Q. As a result, the research found no significant differences in bank performance before and after the adoption of integrated reporting. According to this proof, the implementation of ESG reporting does not help banks.

Adegboyegun (2020) explored the association between integrated reporting and bank financial performance in Nigeria. In the near term, integrated reporting has no meaningful association with bank financial performance, according to the study. Evidence, on the other hand, demonstrated a considerable positive association between integrated reporting and long-term bank performance. As a result of this finding, banks did not reap the direct benefits of ESG reporting.

Garcia and Orsato (2020) found a positive and statistically significant relationship between ESG performance and CFP, but a negative correlation between ESG and CFP at firms in emerging markets, during the study in the developed countries.

Porter and Linde (1995) say that rigorous environmental rules can often boost a company's revenue in the long run by elevating it to captivation by lowering production costs and increasing customer satisfaction and sales. As a result, environmental conventions adopted by corporations may be a "win-win" situation for both the public and the private sector.

Chiong (2010) from his research brought a shred of proof that the association between the environmental disclosure and FP of firms is negative. It was measured using ROE, growth of revenue and debt to equity.

Elsayed and Paton (2005) proved that environmental disclosure had less effect on FP of firms, using ROA, return on sales and Tobin's Q. Though, the proof is poor.

According to the above-mentioned evaluation of literature, ESG reporting can influence corporate financial performance. Although the direction of the connection varies from study to study, this leaves room for more research to determine the relationship in the context of Indian corporations.

Research Objectives

- To understand the impact of ESG practices on Return on Invested Capital (ROIC).
- To determine the effect of ESG practices on Earnings Per Share (EPS).

Hypotheses

- H1A. There is a strong link between environmental activities and CFP.
- H1B. There is a major link between social practices and CFP.
- H1C. There is a significant relationship between Governance practices and CFP.

Research Methodology

- **Scope/Period of Study:** To study the impact of ESG on Corporate FP, a period of five years has been taken ranging from 2018-19 to 2022-23.
- **Sample of study:** The sample for the research shall include BSE 500 manufacturing companies. All banking, insurance and NBFCs are excluded as they are governed by different Acts.
- **Source of Data:** The motive of this empirical study is to know and explore the impact of ESG practices on corporate financial performance. And for this, ESG scores and financial performance data is extracted from companies' published sustainability reports and financial statements. The major source of financial data is BLOOMBERG DATABASE
- **Statistical Tools:** Various statistical tools that will be used are:
 1. Descriptive Statistics
 2. Correlation analysis
 3. Regression analysis
 4. Financial ratios

Analysis and Interpretation

Table 1 represents the descriptive statistics of the study like Mean, Median, Std. Deviation, skewness and Kurtosis of Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD), Return on Invested capital (ROIC), and earning per share (EPS) respectively for the period 2018-2022. The analysis was done based on 701 industries year-wise data.

Table 1: Descriptive statistics of Environment Disclosure, ESG Disclosure, Governance Disclosure, Social Disclosure, Return on Invested capital and Earning per share (EPS).

	Environment Disclosure (ED)	ESG Disclosure (ESGD)	Governance Disclosure (GD)	Social Disclosure (SD)	Return on Invested capital (ROIC)	Earning per share (EPS)
Mean	19.85	41.25	79.88	23.89	13.65	63.83
Median	16.46	38.41	78.60	21.83	11.87	21.60
Std. Dev.	19.22	10.55	6.51	11.15	11.80	233.22
Minimum	0.42	23.29	6.26	0.45	-14.70	-84.89
Maximum	77.29	76.14	96.12	68.53	108.28	3354.20
Skewness	0.97	0.96	-2.46	1.03	3.38	11.03
Kurtosis	3.03	3.22	26.16	4.10	21.28	137.91
Jarque-Bera	110.69	109.64	16371.33	159.15	11097.96	545819.30
Probability	0.000	0.000	0.000	0.000	0.000	0.000
Observations	701	701	701	701	701	701

Environment Disclosure (ED): Mean and SD was 19.85 and 19.22 respectively. Median score was 16.46, where minimum and maximum was 0.42 and 77.29 respectively. Skewness and Kurtosis was 0.97 and 03.03 respectively. Positive value of skewness of Environment disclosure indicated that data is positively skewed and has long tail to right, where positive value of Kurtosis showing the curve is leptokurtic having long and thick tails. and the larger value showing the distribution of data is not normal.

ESG Disclosure (ESGD): Mean and SD was 41.25 and 10.55 respectively. Median score was 38.41, where minimum and maximum was 6.26 and 96.12 respectively. Skewness and Kurtosis was 0.96 and 03.22 respectively. Positive value of skewness of ESG

disclosure indicated that data is positively skewed and has long tail to right, where positive value of Kurtosis showing the curve is leptokurtic having long and thick tails, and the larger value showing the distribution of data is not normal.

Governance Disclosure (GD): Mean and SD was 78.995 and 6.51 respectively. Median score was 21.83, where minimum and maximum was 6.26 and 96.12 respectively. Skewness and Kurtosis was -2.46 and 26.16 respectively. Negative value of skewness of Governance disclosure indicated that data is negatively skewed and has long tail to left, where positive value of Kurtosis showing the curve is leptokurtic having long and thick tail, and the larger value showing the distribution of Governance disclosure is not normal.

Social Disclosure (SD): Mean and SD was 23.89 and 11.15 respectively. Median score was 21.83, where minimum and maximum was 0.45 and 68.45 respectively. Skewness and Kurtosis was 1.03 and 4.10 respectively. Positive value of skewness of social disclosure indicated that data is positively skewed and has long tail to right, where positive value of Kurtosis showing the curve is leptokurtic having long and thick tails and where the larger value showing the distribution of data is not normal.

Return on Invested capital (ROIC): Mean and SD was 13.65 and 11.80 respectively. Median score was 11.87, where minimum and maximum was -14.70 and 108.28 respectively. Skewness and Kurtosis was 3.38 and 21.28 respectively. Positive value of skewness of data indicated that data is positively skewed and has long tail to right, where positive value of Kurtosis showing the curve is leptokurtic having long and thick tails, where the larger value showing the distribution of data is not normal.

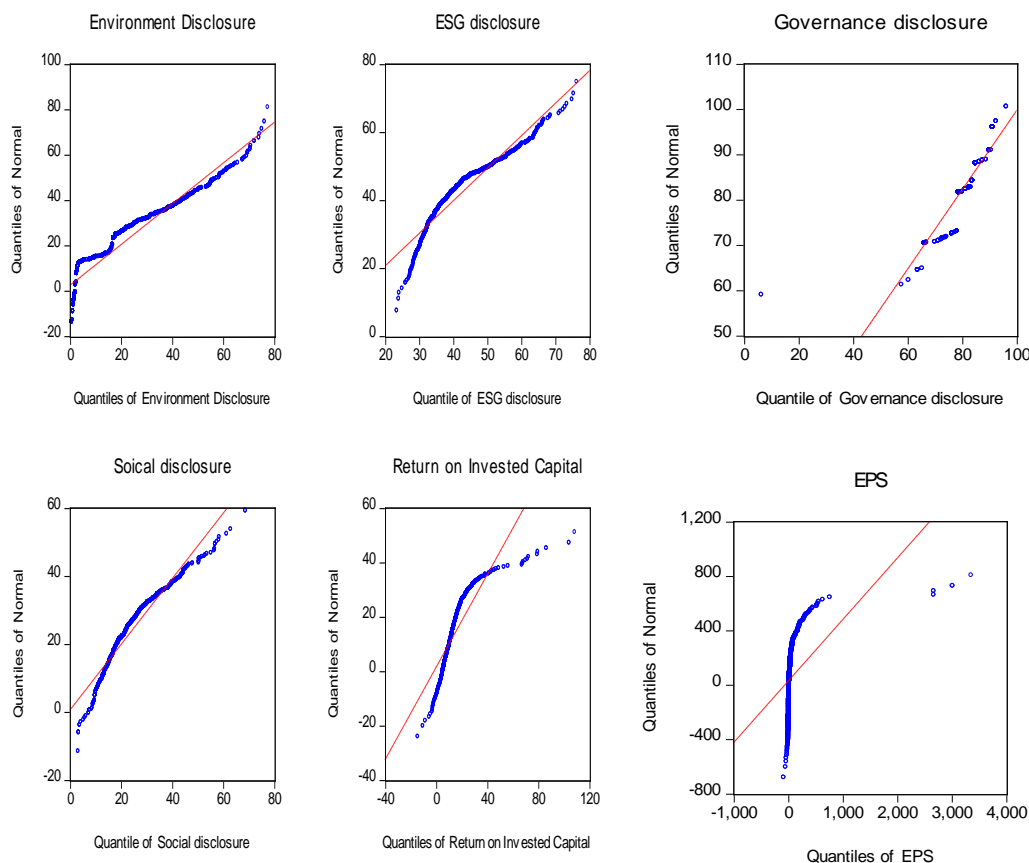
Earnings per share (EPS): Mean and SD was 63.83 and 233.22 respectively. Median score was 21.60, where minimum and maximum was -84.89 and 3354.20 respectively. Skewness and Kurtosis was 11.03 and 137.91 respectively. More value of skewness and kurtosis of EPS showed the distribution of data is not normal and have outlier values.

From Jarque–Bera statistic value: This statistics is used to test a null hypothesis where all variables is considered to have a normal distribution. The result in table 1 show that the data do not support the supposition that each scores/variables has a normal distribution, since the null hypothesis that each variables has a normal distribution is rejected as $p < 0.05$.

Distribution over time

Distribution of each variable over time is shown by Quintile plot.

Figure 1: Quintile plot for Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD), Return on Invested capital (ROIC) and Earning per share (EPS).



Stationarity and normality of variables:

To check stationarity of time series, unit root test, which includes the parametric Augmented Dicky-Fuller test (ADF) test and normality of variables is shown by using Kolmogorov-Smirnov test.

According to Augmented Dicky-Fuller test, we have under null hypothesis: All variables are not stationary and alternatively hypothesis: all variables are stationary.

According to Kolmogorov-Smirnov test, we have under null hypothesis: All variables are normally distributed and alternatively hypothesis: all variables are not normally distributed

Table 2: Unit Root test: Augmented Dickey-Fuller test statistic

		ADF test		Kolmogorov-Smirnov	
		t-statistics	p-value	Z test	p-value
Environment Disclosure	ED	-10.44	0.000**	4.437	0.000**
ESG Disclosure	ESGD	-10.40	0.000**	4.356	0.000**
Governance Disclosure	GD	-17.57	0.000**	2.474	0.000**
Social Disclosure	SD	-09.94	0.000**	9.700	0.000**
Return on Invested capital	ROIC	-12.65	0.000**	4.134	0.000**
Earning per share	EPS	-07.01	0.000**	2.773	0.000**

**p<0.01

Table 2 represents the ADF test and Kolmogorov-Smirnov test of the variables. ADF test shows the stationary of variable and Kolmogorov-Smirnov test shows the normality of variables. Under null hypothesis: all variables are not stationary, since p-value is lesser than 0.05, we reject the null hypothesis and accept the alternative hypothesis that all variables are stationary at level. According to Kolmogorov-Smirnov test: Under null hypothesis: all variables follow normal distribution, since p-value is lesser than 0.05. Hence we reject the null hypothesis, and we accept the alternative hypothesis that all variables do not follow normal distribution.

1) Relation between Return on Invested capital (ROIC) and Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD) , Firm Size (FS)

Table 3 : Correlation of Return on Invested capital (ROIC) and Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD) , Firm Size (FS)

	Return of Invested capital (ROIC)	Environment Disclosure (ED)	ESG Disclosure (ESGD)	Governance Disclosure (GD)	Social Disclosure (SD)	Firm Size (FS)
Return on Invested capital (ROIC)	1	-0.055	-0.061	-0.053	-0.047	-0.222**
Environment Disclosure (ED)	-0.055	1	0.946**	0.374**	0.746**	0.587**
ESG Disclosure (ESGD)	-0.061	0.946**	1	0.563**	0.880**	0.584**
Governance Disclosure (GD)	-0.053	0.374**	0.563**	1	0.369**	0.324**
Social Disclosure (SD)	-0.047	0.746**	0.880**	0.369**	1	0.455**
Firm Size (FS)	-0.222**	0.587**	0.584**	0.324**	0.455**	1

**Correlation is significant at 0.01 level of significance

Table 3 represent the correlation between of Return on Invested capital, Environment Disclosure, ESG Disclosure, Governance Disclosure, Social Disclosure and Firm Size. Return of Invested capital showed negative and significant correlation with firm size (Corr=-0.222,p<0.01) at 0.01 level where as Environment disclosure (Corr=-0.055,p>0.05), ESG disclosure (Corr=-0.061,p>0.05), Governance disclosure (Corr=-0.053,p>0.05) and Social disclosure (Corr=-0.047,p>0.05) at 0.05 level of significance. Further, we can see the relationship between of Return of Invested capital, Environment Disclosure, ESG Disclosure, Governance Disclosure, Social Disclosure and firm size using the scattered diagram in Figure 4. We can see the decreasing pattern of points in Figure 4(1-5) wrt Return on Invested capital.

Figure 4: Scattered diagram of Return on Invested capital (ROIC) and Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD), Firm Size (FS)

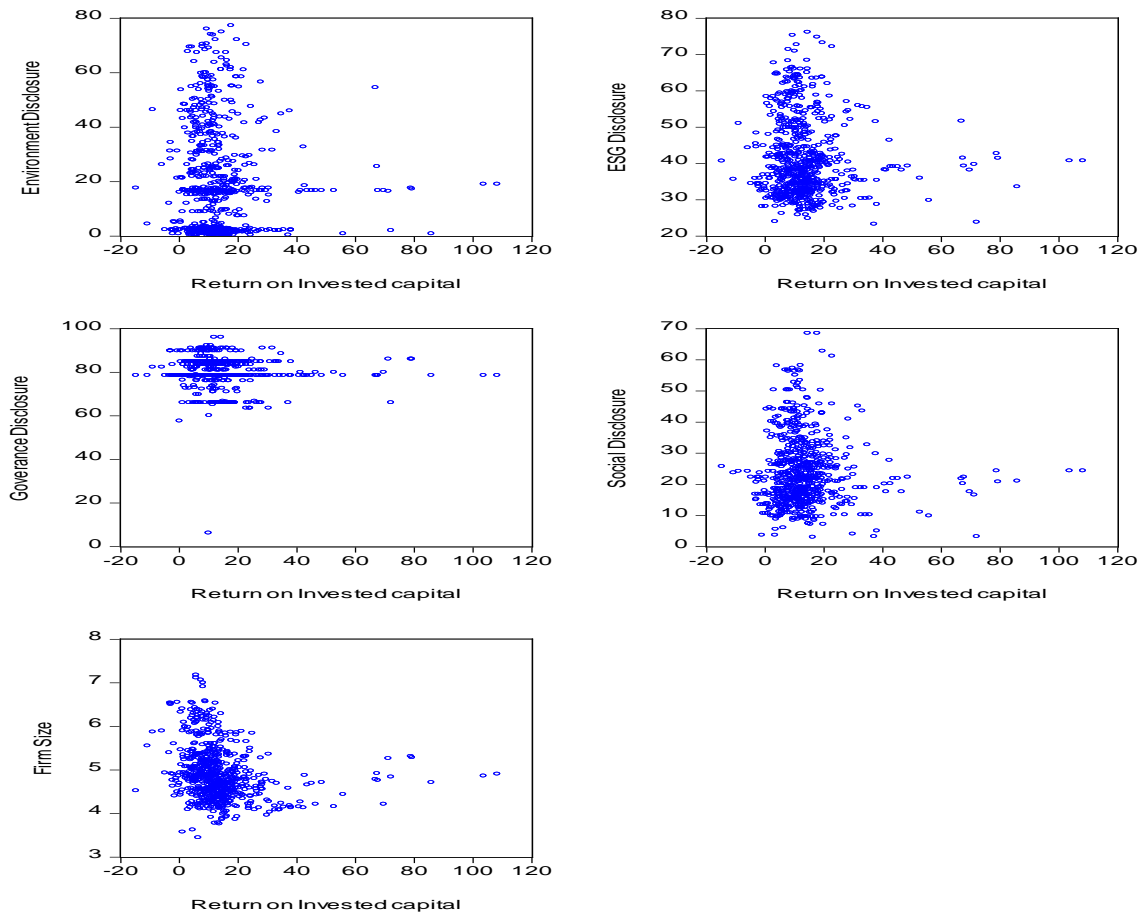


Table 4: Granger-Causality test for model 1

Null Hypothesis:	Obs	F-Statistic	Prob.	Remark
Environment disclosure does not Granger Cause Return on Invested capital	699	0.9945	0.3704	Accepted
Return on Invested capital does not Granger Cause Environment disclosure		0.6623	0.5160	Accepted
ESG Disclosure does not Granger Cause Return on Invested capital	699	1.7162	0.1805	Accepted
Return on Invested capital does not Granger Cause ESG Disclosure		0.6434	0.5258	Accepted
Governance Disclosure does not Granger Cause Return on Invested capital	699	0.7709	0.4630	Accepted
Return on Invested capital does not Granger Cause Governance Disclosure		2.0502	0.1295	Accepted
Social Disclosure does not Granger Cause Return on Invested capital	699	2.7085	0.0673	Accepted

Return on Invested capital does not Granger Cause Social Disclosure		0.0297	0.9708	Accepted
Firm Size does not Granger Cause Return on Invested capital	699	1.7806	0.1693	Accepted
Return on Invested capital does not Granger Cause Firm Size		0.3041	0.7379	Accepted
ESG Disclosure does not Granger Cause Environment disclosure	699	1.3075	0.2712	Accepted
Environment disclosure does not Granger Cause ESG Disclosure		1.6075	0.2011	Accepted
Governess Disclosure does not Granger Cause Environment Disclosure	699	0.7599	0.4681	Accepted
Environment Disclosure does not Granger Cause Governess Disclosure		4.5711	0.0107	Rejected
Social Disclosure does not Granger Cause Environment Disclosure	699	2.3330	0.0978	Accepted
Environment Disclosure does not Granger Cause Social Disclosure		0.3596	0.6981	Accepted
Firm size does not Granger Cause Environment Disclosure	699	1.9509	0.1429	Accepted
Environment Disclosure does not Granger Cause Firm size		1.7409	0.1761	Accepted
Governess Disclosure does not Granger Cause ESG Disclosure	699	5.4108	0.0047	Rejected
ESG Disclosure does not Granger Cause Governess Disclosure		3.7651	0.0236	Rejected
Social Disclosure does not Granger Cause ESG Disclosure	699	3.7537	0.0239	Rejected
ESG Disclosure does not Granger Cause Social Disclosure		0.6199	0.5383	Accepted
Firm size does not Granger Cause ESG Disclosure	699	2.4826	0.0843	Accepted
ESG Disclosure does not Granger Cause Firm size		3.4517	0.0322	Rejected
Social Disclosure does not Granger Cause Governess Disclosure	699	2.4449	0.0875	Accepted
Governess Disclosure does not Granger Cause Social Disclosure		1.5524	0.2125	Accepted
Firm size does not Granger Cause Governess Disclosure	699	6.7513	0.0012	Rejected
Governess Disclosure does not Granger Cause Firm size		2.7992	0.0615	Accepted
Firm size does not Granger Cause Social Disclosure	699	0.5043	0.6042	Accepted
Social Disclosure does not Granger Cause Firm size		3.8993	0.0207	Rejected

Table 4 represent the Granger-Causality test result of Model 1. Under null hypothesis ROIC does not Granger Cause with other variables. Since, p-value is greater than 0.05, we can accept the hypothesis that ROIC does not Granger Cause. Furthermore, if we see vice-versa relation of variables, We find Governess Disclosure does Granger Cause ESG Disclosure (F=5.4108, p<0.05), ESG Disclosure does Granger Cause Governess Disclosure (F=3.7651, p<0.05), Social Disclosure does Granger Cause ESG Disclosure (F=3.7537, p<0.05), ESG Disclosure does Granger Cause Firm size (F=3.4517, p<0.05), Firm size does

Granger Cause Governess Disclosure ($F=6.7513, p<0.05$) and social Disclosure does Granger Cause Firm size ($F=3.8993, p<0.05$). Therefore, we reject the null hypothesis that one variable dose not granger cause as p-value is lesser than 0.05.

Table 5: Breusch-Godfrey Serial Correlation LM Test

F-statistic	223.6825	Prob. F(2,693)	0.0000
Obs*R-squared	275.0022	Prob. Chi-Square(2)	0.0000

Table 5 represents Serial correlation test using the Breusch-Godfrey Serial Correlation LM Test. The hypothesis there is no serial correlation between variables in the model. As we see R-squared values ($275.0022, p<0.05$) are lesser than the critical p-value (0.05). This leads to the decision of rejecting the null hypothesis of no serial correlation. Hence we reject the null hypothesis of no serial correlation. Further, in order to removal the problem of serial correlation we use HAC test in model 1.

Table 6: Heteroskedasticity Test: Breusch-Pagan-Godfrey of Model 1

F-statistic	0.570129	Prob. F(5,695)	0.7230
Obs*R-squared	2.863508	Prob. Chi-Square(5)	0.7210

Table 6 represents the heteroskedasticity Test using Breusch-Pagan-Godfrey approach. Under Null hypothesis there is no problem of heteroskedasticity in model 1. The value Chi-square ($=2.863508$) is found to be non-significant, since $p=0.7210$, which greater than critical p-value (0.05). Hence, we accept the null hypothesis mean there is no problem of heteroskedasticit in Model 1, we can proceed further the relationship among the variables.

Table 7: Co-integration results of Model 1

	Trace statistics	Critical value	Prob.**	Max-Eigen statistics	Critical value	Prob.**
None *	628.8859	117.7082	0.0000	156.9417	44.49720	0.0000
At most 1 *	471.9442	88.80380	0.0000	118.2214	38.33101	0.0000
At most 2 *	353.7229	63.87610	0.0000	114.2948	32.11832	0.0000
At most 3 *	239.4281	42.91525	0.0000	93.75803	25.82321	0.0000
At most 4 *	145.6700	25.87211	0.0000	81.49684	19.38704	0.0000
At most 5 *	64.17319	12.51798	0.0000	64.17319	12.51798	0.0000

Trace test and Max-eigenvalue test indicates 6 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The Johansen test of co-integration results summarize in Table7. Result indicates the presence of a co-integration relation between the variables. The results of Trace and Maximum Eigenvalue tests indicate that at the 5% significance level there are at least six co-integration equations. Thus, there is a valid and stable long-run relationship between

dependent and independent variables. This test gives the right to proceed with the estimation of a designed regression model.

Table 8 shows the model summary of model taking analysis taking dependent as Return on Invested Capital. The result shows that the value of R square is 0.059; it implies that about 5.9% of changes in dependent variable are explained by the changes in independent variables.

The value of Adjusted R square is 0.052 and SE is 11.48. The F value (=8.760422) and Wald F-statistics=5.681 found to be significant as p value of the model is 0.000 which is less than 0.05. This mean there is linear relationship between dependent and independent variables.

Table 8: Ordinary least square regression analysis taking dependent as Return on Invested Capital

	Coefficient	Std. Error	t-Statistic	p-value
Constant	40.277	8.651	4.656	0.000**
Environment disclosure	-0.437	0.337	-1.299	0.194
ESG disclosure	1.527	0.992	1.539	0.124
Governance disclosure	-0.517	0.339	-1.525	0.128
Social disclosure	-0.509	0.327	-1.556	0.120
Firm size	-5.604	1.169	-4.795	0.000**
R-squared	0.059288	Mean dependent variable		13.65058
Adjusted R-squared	0.052520	S.D. dependent variable		11.79582
S.E. of regression	11.48188	Akaike info criterion		7.727940
Sum squared residual	91624.34	Schwarz criterion		7.766906
Log likelihood	-2702.643	Hannan-Quinn criterion		7.743001
F-statistic	8.760422	Durbin-Watson stat		0.758576
p-value	0.0000**	Wald F-statistic		5.681
		p-value		0.0000**

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 7.0000)

**p<0.01

Dependent variable- Return on Invested Capital

From Table 8, we seen that the firm size with beta value (= -5.604), p<0.01), which is negative and significant at 0.01 level of significance, which showed negative relationship with return on invested capital. The beta value of Environment disclosure (= -0.437, p>0.05), ESG disclosure (=1.527, p>0.05), Governance disclosure (= -0.509, p>0.05), and Social disclosure (= -0.509, p>0.05) showed non-significant difference at 0.05 level. Hence the hypothesis **H01 that there exist is a significant relationship between return on invested capital and Environment disclosure, ESG disclosure, Governance disclosure and Social disclosure** was partially accepted.

From above discussion of the model we concluded that the Return on Invested Capital is decreased by 5.604 with increase of one unit in firm size.

2) Relation between earning per share (EPS) and Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD), Firm Size (FS)

Table 21 : Correlation of Return on assets (ROA) and Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD) , Firm Size (FS)

	Earnings per share	Environment Disclosure (ED)	ESG Disclosure (ESGD)	Governance Disclosure (GD)	Social Disclosure (SD)	Firm Size (FS)
Earnings per share	1	0.008	-0.001	-0.017	-0.009	0.037
Environment Disclosure (ED)	0.008	1	0.946**	0.374**	0.746**	0.587**
ESG Disclosure (ESGD)	-0.001	0.946**	1	0.563**	0.880**	0.584**
Governance Disclosure (GD)	-0.017	0.374**	0.563**	1	0.369**	0.324**
Social Disclosure (SD)	-0.009	0.746**	0.880**	0.369**	1	0.455**
Firm Size (FS)	0.037	0.587**	0.584**	0.324**	0.455	1

**Correlation is significant at 0.01 level of significance

Table 15 represent the correlation between of Earnings per share, Environment Disclosure, ESG Disclosure, Governance Disclosure, Social Disclosure and Firm Size. Earnings per share showed negative and non-significant for ESG disclosure (Corr=-0.001,p>0.05), Governance disclosure (Corr=-0.017,p>0.05),Social disclosure (Corr=-0.009,p>0.05) at 0.05 where positive and non-significant for Environment disclosure (Corr=0.008,p>0.05), and firm size (Corr=0.037,p>0.05) at 0.05 level of significance. Further, we can see the relationship between of earning per share and Environment Disclosure, ESG Disclosure, Governance Disclosure, Social Disclosure and firm size using the scattered diagram in Figure 7. We can see that the increasing pattern of points in Environment Disclosure and Firm size and decreasing pattern of point for remaining Figure 7(1-5) wrt earning per share.

Figure 7: Scattered diagram of Earning per share (EPS) and Environment Disclosure (ED), ESG Disclosure (ESGD), Governance Disclosure (GD), Social Disclosure (SD) , Firm Size (FS)

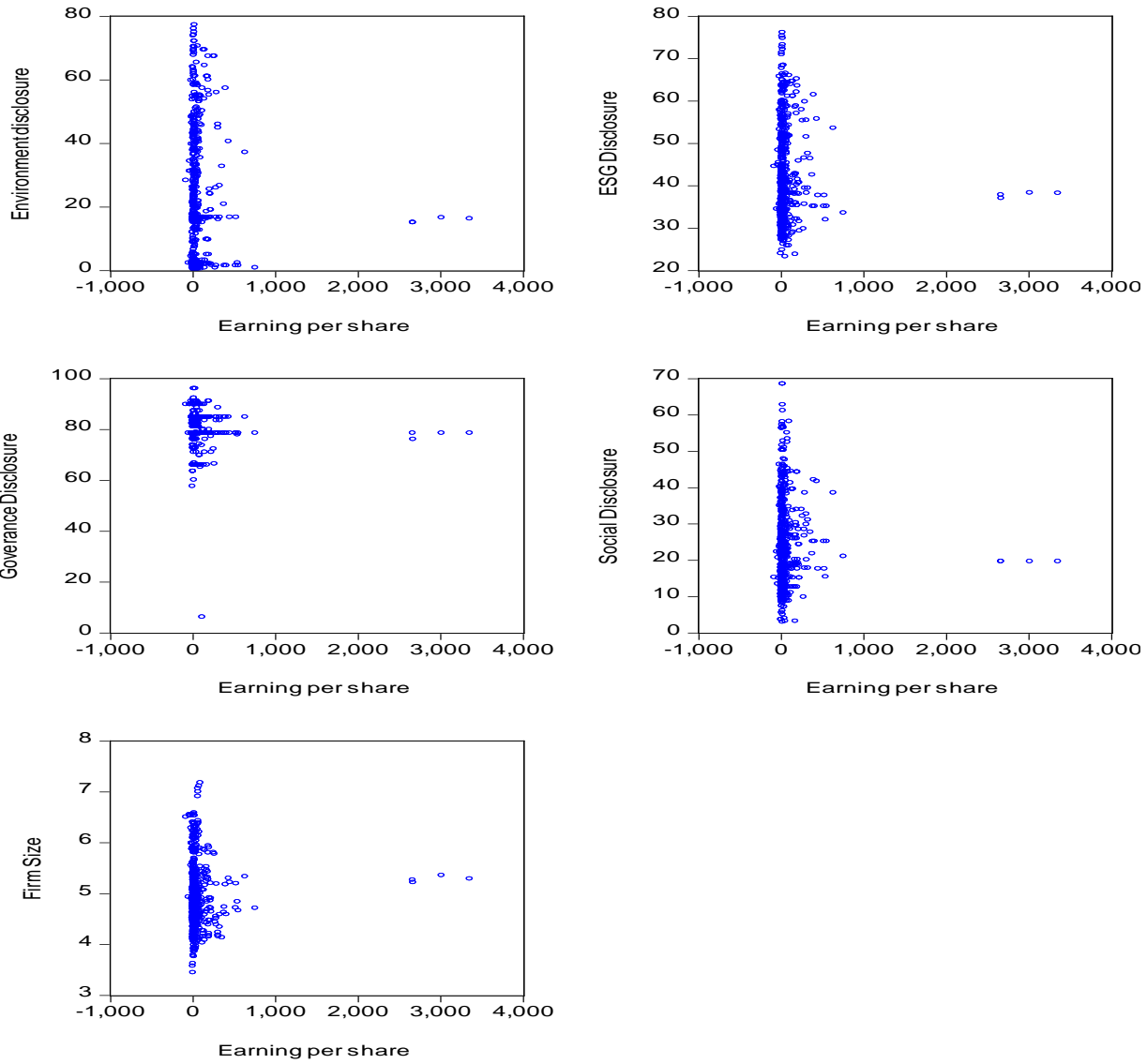


Table 22 : Granger-Causality test for Model 4

Null Hypothesis:	Obs	F-Statistic	Prob.	Remark
Environment disclosure does not Granger Cause Earnings per share	696	3.37309	0.0051	Rejected
Earnings per share does not Granger Cause Environment disclosure		0.10955	0.9902	Accepted
ESG disclosure does not Granger Cause Earnings per share	696	2.38048	0.0373	Rejected
Earnings per share does not Granger Cause ESG disclosure		0.09405	0.9931	Accepted
Governance Disclosure does not Granger Cause Earnings per share	696	1.00405	0.4143	Accepted
Earnings per share does not Granger Cause Governance Disclosure		0.10539	0.9911	Accepted
Social Disclosure does not Granger Cause Earnings per share	696	1.15649	0.3292	Accepted
Earnings per share does not Granger Cause Social Disclosure		0.13958	0.9830	Accepted

Firm size does not Granger Cause Earnings per share	696	0.56225	0.7290	Accepted
Earnings per share does not Granger Cause Firm size		0.46961	0.7990	Accepted
ESG Disclosure does not Granger Cause Environment disclosure	696	0.92909	0.4614	Accepted
Environment disclosure does not Granger Cause ESG Disclosure		1.00419	0.4142	Accepted
Governance Disclosure does not Granger Cause Environment disclosure	696	0.71495	0.6123	Accepted
Environment disclosure does not Granger Cause Governance Disclosure		2.42945	0.0339	Accepted
Social Disclosure does not Granger Cause Environment disclosure	696	1.49132	0.1904	Accepted
Environment disclosure does not Granger Cause Social Disclosure		1.35945	0.2376	Accepted
Firm size does not Granger Cause Environment disclosure	696	1.14157	0.3369	Accepted
Environment disclosure does not Granger Cause Firm size		1.70752	0.1306	Accepted
Governance Disclosure does not Granger Cause ESG Disclosure	696	2.47035	0.0313	rejected
ESG Disclosure does not Granger Cause Governance Disclosure		2.21058	0.0516	Accepted
Social Disclosure does not Granger Cause ESG Disclosure	696	1.69296	0.1340	Accepted
ESG Disclosure does not Granger Cause Social Disclosure		1.11893	0.3488	Accepted
Firm size does not Granger Cause ESG Disclosure	696	1.14638	0.3344	Accepted
ESG Disclosure does not Granger Cause Firm size		1.97764	0.0799	Accepted
Social Disclosure does not Granger Cause Governance disclosure	696	1.49935	0.1878	Accepted
Governance disclosure does not Granger Cause Social Disclosure		0.68501	0.6349	Accepted
Firm size does not Granger Cause Governance disclosure	696	2.87322	0.0141	Accepted
Governance disclosure does not Granger Cause Firm size		1.15385	0.3305	Accepted
Firm size does not Granger Cause Social Disclosure	696	0.61637	0.6874	Accepted
Social Disclosure does not Granger Cause Firm size		2.26556	0.0465	Accepted

Table 23 represent the Granger-Causality test result of Model 4. Under null hypothesis earning per share does not Granger Cause with other variables. Since, p-value is greater than 0.05, we can accept the hypothesis that earning per share does not Granger Cause. Furthermore, if we see vice-versa relation of variables. We find that Environment disclosure does not Granger Cause Earnings per share ($F=3.37309$, $p<0.01$), ESG disclosure does not Granger Cause Earnings per share ($F=2.38048$, $p<0.05$), and Governance Disclosure does not Granger Cause ESG Disclosure ($F=2.47035$, $p<0.05$) has p-value lesser than 0.05, Hence we reject the null hypothesis that one variable dose not granger cause.

Table 24: Breusch-Godfrey Serial Correlation LM Test

F-statistic	445.3302	Prob. F(2,693)	0.0000
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Obs*R-squared	394.2467	Prob. Chi-Square(2)	0.0000
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Table 24 represents Serial correlation test using the Breusch-Godfrey Serial Correlation LM Test for Model 4. The null hypothesis that there is no serial correlation between variables in the model. As we see R-squared values (394.2467, $p < 0.05$) are lesser than the critical p-value (0.05). Hence we reject the null hypothesis of no serial correlation. Further, in order to removal the problem of serial correlation we use HAC test in model.

Table 25: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.850587	Prob. F(5,695)	0.5141
Obs*R-squared	4.23559	Prob. Chi-Square(5)	0.5121

Table 25 represents the heteroskedasticity Test using Breusch-Pagan-Godfrey approach. Under Null hypothesis there is no problem of heteroskedasticity in Model 3. The value Chi-square(=4.23559) is found to be non-significant, since $p = 0.51219$, which greater than critical p-value (0.05). Hence, we accept the null hypothesis mean there is no problem of heteroskedasticit in model, we can proceed.

Table 26: Co-integration results of Model 3

	Trace statistics	Critical value	Prob.**	Max-Eigen Statistics	Critical value	Prob.**
None *	604.3803	95.75366	0.0001	156.5918	40.07757	0.0001
At most 1 *	447.7886	69.81889	0.0001	126.4914	33.87687	0.0000
At most 2 *	321.2972	47.85613	0.0001	95.64966	27.58434	0.0000
At most 3 *	225.6475	29.79707	0.0001	91.23943	21.13162	0.0000
At most 4 *	134.4081	15.49471	0.0001	75.66585	14.26460	0.0000

At most 5 *	58.74224	3.841466	0.0000	58.74224	3.841466	0.0000
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Trace test and Max-eigenvalue test indicates 6 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The Johansen test of co-integration results summarize in Table 26. Result indicates the presence of a co-integration relation between the variables. The results of Trace and Maximum Eigenvalue tests indicate that at the 5% significance level there are at least six co-integration equations. Thus, there is a valid and stable long-run relationship between dependent and independent variables. This test gives us the right to proceed with the estimation of a designed regression model.

Table 26 shows the model summary of model 4 taking analysis taking dependent as earning per share . The result shows that the value of R square is 0.043; it implies that about 4.3% of changes in dependent variable are explained by the changes in independent variables.

The value of Adjusted R square is -0.004 and SE is 233.25. The F value (=0.4086) and Wald F-statistic (F=1.883,P>0.05) found to be non-significant at 0.05 level of significance. This mean there is non-linear relationship between dependent and independent variables in Model 4.

Table 8: Ordinary least square regression analysis taking dependent as EPS

	Coefficient	Std. Error	t-Statistic	p-value
Constant	53.049	78.514	0.676	0.676
Environment disclosure	-2.797	1.330	-2.102	0.807
ESG disclosure	8.756	3.224	2.716	0.799
Governance disclosure	-3.912	1.597	-2.450	0..74
Social disclosure	-3.614	1.401	-2.579	0.258
Firm size	21.203	31.058	0.683	0.678
R-squared	0.0029	Mean dependent variable		63.25677
Adjusted R-squared	-0.0042	S.D. dependent variable		232.765
S.E. of regression	233.2582	Akaike info criterion		13.75069
Sum squared residual	37814532	Schwarz criterion		13.78966
Log likelihood	-4813.617	Hannan-Quinn criterion		13.76575
F-statistic	0.4086	Durbin-Watson stat		0.516958
p-value	0.8430	Wald F-statistic		1.883
		p-value		0.095

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 7.0000)

**p<0.01

Dependent variable- EPS

From Table 26, we seen that the beta value of Environment disclosure (= -2.797, p>0.05), ESG disclosure (=8.756, p>0.05), Governance disclosure (= -3.912, p>0.05), and Social disclosure (= -3.614, p>0.05) and Social disclosure (=21.203, p>0.05) showed non-significant difference at 0.05 level. Hence, the hypothesis **H04 that there exist is a significant relationship between EPS and Environment disclosure, ESG disclosure, Governance disclosure and Social disclosure** was rejected.

Conclusion

Globally, sustainability practises are proliferating, and there is increased awareness in the connection between ESG and businesses' financial performance. (Alsayegh et al., 2020; Bodhanwala and Bodhanwala, 2018; Pan et al., 2014; Velte, 2017). Global publicly listed companies are beginning to prioritise accomplishing long-term environmental, social, and governance (ESG) goals over optimising short-term financial gains. The majority of corporate executives today acknowledge the rising significance of environmental sustainability problems. They have begun to think that this may have an impact on an organization's financial stability and standing in the industry. According to a recent study, businesses with high ESG performance may also be able to improve their financial performance. The relationship between ESG and financial success has not gotten much attention in India. Through the analysis of both dynamic and static panel data, this study investigates the relationship between ESG practises and financial indices in publicly listed companies in India. Gathering financial data from Bloomberg and preprocessing it with descriptive statistics is our first step. It was looked at how ESG factors affected manufacturing businesses' financial performance from 2018 to 2022. Based on year-by-year data from 701 BSE manufacturing businesses, the study was completed. The ESG scores are the dependent variable, while the performance measures, such as earnings per share and return on invested capital (ROIC), are the independent variables (EPS). Firm size is the control variable that is used.

The empirical findings indicate that ESG doesn't have a substantial positive impact on performance. However, the relationship between ESG disclosures do vary if measured individually; the disclosures are found putting positive effect on ROIC but EPS.

Financial performance may be improved through ESG activities, which could have an impact on investors, business administrators, decision-makers, and industry regulations.

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