

Empirically examining the impact of corporate social responsibility on financial performance: evidence from Indian steel industry

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Abstract

Purpose – This paper aims to examine the impact of corporate social responsibility (CSR) on financial performance (FP) of Indian steel industry in terms of value-added (VAM), profitability (PM), market (MM) and growth measures (GM).

Design/methodology/approach – It is an empirical study using secondary data of 40 companies for 14 years collected from CSR/annual reports/official websites of the companies and Prowess database. The panel regression analysis, MANOVA and univariate ANOVA have been conducted to examine the impact of CSR on FP.

Findings – The result indicates a positive impact of CSR on FP in terms of VAM, PM and GM, thereby indicating that more investments in CSR will generate wealth for shareholders, enhance profitability and sales. Moreover, this study shows no noticeable relationship between CSR and MM.

Social implications – This study contributes to the literature on the CSR–FP relationship and also has implications for managers, investors and other stakeholders. Companies with higher CSR rating create a brand image, attract proficient employees, get greater profit, loyal customers and have less possibility of bribery and corruption. This study may result in being influential to companies confined not only to this sector but also reaching to the others, thus inspiring them to contribute their share of profit for the welfare of society.

Originality/value – To the best of the authors' knowledge, it is the first comprehensive study to examine the impact of CSR on FP of Indian steel industry by considering four dimensions for measuring FP. It provides evidence about the relationship between CSR and FP.

Keywords Corporate social responsibility, Financial performance, Value-added measures, Profitability measures, Market measures, Growth measures

Paper type Research paper

1. Introduction

The role of a company towards the social context within which it operates has been altered over the past few years due to globalization and pressing ecological issues (Pradhan and Ranjan, 2010). Now the companies, universally, try to meet the needs of the present generation without compromising the ability of the next generations to meet their own needs (Babalola, 2012). Consequently, due the shift from merely profit to profit with social responsibility, many companies are approving the term “Corporate Social Responsibility (CSR)”. CSR is beyond the legal duties and obligations as it a voluntary initiative by companies which is apparently encouraged by both the national and international governments, but they are reluctant to regulate it. It is a continuation of the motivation that led earlier businesses into the field of philanthropy, which gradually developed into a



broader concept of the responsibility of stewardship (Tripathi and Agarwal, 2015). Nowadays, the importance of CSR activities can be seen through the presence of these activities in the annual and sustainability reports and official websites of the companies (Servaes and Tamayo, 2013).

Traditionally, companies focussed mainly on such strategies which helped them to maximize their profit. However, contemporary developments in strategic thinking encourage to add CSR activities in companies' strategies for achieving competitive goals (Yoo and Lee, 2018). Application of CSR is now considered as an investment not as a cost (Mulyadi and Anwar, 2012). CSR has widened the area of companies from stockholders to stakeholder by allocating responsibility towards all those associations which are affected by the company (Maqbool and Zameer, 2018). A company gets numerous benefits from society, so it must provide something in return to it.

The relation between CSR and financial performance (FP) has induced considerable interest amongst researchers. Though many preceding studies have used a small range of tools to measure FP, our study is prolonged to include a broader range of FP measures. Specifically, we explore four dimensions, namely, value-added (VAM), profitability (PM), market (MM) and growth measures (GM). The results of prior studies on this issue are inconclusive, showing positive, negative and no relationship amongst them.

The belief that CSR activities are carried on the expense of shareholder wealth captures the centre stage at the CSR debate (Harjoto and Laksmana, 2018). Friedman (2007) debated that CSR served only to the personal benefit of managers to raise their reputation in society; hence, it would generate higher personal wages, whereas shareholders would suffer loss because CSR activities involved huge cost and did not generate profit from these activities. Hence, it is essential to study whether CSR enhances shareholder value or pay too much attention on other stakeholders, thus lowering firm value (Servaes and Tamayo, 2013). Some studies showed the positive relation between two concepts (Kim and Kim, 2014; El Ghoul *et al.*, 2017), some indicated negative relationship (Daszyńska-Żygadlo *et al.*, 2016; Manchiraju and Rajgopal, 2017; Singh *et al.*, 2017) and others found no significant relationship between them (Mulyadi and Anwar, 2012; Zhang *et al.*, 2017).

Additionally, some researchers found a positive relationship between CSR and PM (Mishra and Suar, 2010; Hafez, 2016; Abilasha and Tyagi, 2019), showing the enduring benefits of CSR by cost saving and differentiation. Nevertheless, other researchers found a negative relationship (Babalola, 2012; Folajin *et al.*, 2014; Chen *et al.*, 2018). As per these studies, CSR involves costs which influence the profits negatively. Lee and Park (2010) found no relationship between the two notions.

We have also used MM (Arx and Ziegler, 2008) to check the impact of CSR on FP. No clear idea has been drawn from the prior study whether investment in CSR is favourable or detrimental to returns. Studies showing positive results claimed that enhanced CSR may increase stock returns through cost reductions and productivity improvements (Daszyńska-Żygadlo *et al.*, 2016; Maqbool and Zameer, 2018). However, some authors exhibited a negative relationship between CSR and MM (Brammer *et al.*, 2006), while others arrived at no significant relation between them (Wang *et al.*, 2011).

The FP of the company can no longer be measured only through value and profit maximization. But a company is also supposed to take more responsibilities of the economy and society as well. The aim of the company should be extended from value maximization to social growth (Wang, 2011). CSR does not only provide competitive advantage to the company over others but also helps in growing business in the society by increase in sales. Authors who found a positive relation between CSR and GM suggested that by concentrating on the financial achievement and communal growth, the company can boost its performance rapidly as compared to competitors (Awan and Saeed, 2015; Assaf *et al.*, 2017). Some other

authors such as Kapoor and Sandhu (2010) and Paul and Devi (2016) did not find any significant relation between these two concepts.

Although a positive relation between CSR and FP has existed in many studies, still the results remain indecisive. Such indecisiveness creates field for further investigation.

CSR is primarily believed as a Western phenomenon because of sound institutions, better standards and appeal systems which are weak in developing countries like India that challenges Indian companies to participate in CSR (Mishra and Suar, 2010). India has one of the oldest traditions of CSR. But CSR practices are practised for namesake only (Tripathi and Agarwal, 2015). Initially, the Ministry of Corporate Affairs (MCA) has revealed voluntary guidelines of CSR for companies. Indian companies have slightly been proactive in taking up CSR initiatives. Thereafter, in 2013, the new Companies Act 2013 made it mandatory for every companies having net worth more than 500 crores or more, a turnover of Rs. 1,000 crores or more or net profit of Rs. 5 crores or more during any financial year should contribute 2% of their average net profit during the three immediately preceding financial years towards CSR, and these companies are also suggested to form separate CSR committee and also to disclose CSR activities in the official annual report.

India has achieved a prominent place in the world steel industry. India was the second largest producer of the crude steel in 2019 with production at 111.2 MT, surpassing Japan, and India is the third largest consumer of finished steel in the world, headed by China and Japan. Contribution of steel in gross domestic product (GDP) is over two per cent (www.ibef.org). In India, the steel industry has a glorious history of getting engaged in different kinds of social activities, which is formally known as CSR like eradicating poverty and malnutrition, promoting education, vocation skills and gender equality, ecological balance, protection of national heritage, rural development projects, etc. But in some recent years, there is tremendous growth in this involvement due to implementation of the Companies Act 2013 and the National Steel Policy 2012, which suggest the companies to involve in these activities in a more structured way for sustainable development.

This study is different from the prior studies on three bases. Firstly, unlike the previous research studies, it focusses only on the Indian steel industry. Secondly, it considers four different dimensions of FP, covering almost all the aspects. Lastly, it also depicts which dimension of FP is most influenced by CSR activities by using MANOVA, which is also not used in earlier research studies.

In this context, the main aim of the study is to examine the impact of CSR on FP of Indian steel industry. For that, a sample of 40 steel companies has been selected. A total of four different regression models have been generated for four dimensions of FP, namely, VAM, PM, MM and GM, considering them as dependent variables. Age, size and risk were elected as control variables.

The study revealed that CSR has a positive relationship on firm value (shareholders wealth creation in long run), profitability and growth (in terms of sales and assets) but no relationship with stock returns, which probably implies that more involvement in CSR leads higher returns to the long-term investors, greater profitability and improved growth of the companies but fails to prompt returns. Findings of this study are expected to contribute not only to the existing CSR literature but also to management in steel companies by specifying strategic vision for the beneficial impact of CSR on enhancing firm value by taking into account legitimate stakeholders.

The rest of the article is organized as follows. The "Literature review" section reviews the concerned literature. The sources of data and the methodology are described in the "Database and methodology" section. The "Empirical Analysis and results" section presents empirical results. Details about results are presented in the "Discussion" part. In the final section, conclusions are summarized.

2. Literature review

Active debates regarding financial issues of CSR mainly stem from [Friedman \(1970\)](#) and [Narver \(1971\)](#) ([Lee and Park, 2010](#)). [Friedman \(1970\)](#) asserted that a company's core responsibility is to increase shareholders' value and not to be responsible for societal issues, whereas [Narver \(1971\)](#) argued that a corporation can maximize its company value only by voluntarily taking actions on external issues ([Lee and Park, 2010](#)). Ever since, numerous researchers have endeavoured to enhance the understanding of the CSR effects on FP. The results have been equivocal. Previous studies have been divided into four categories as CSR and VAM, CSR and PM, CSR and MM and CSR and GM, showing positive, negative or no relationship amongst them, which are as follows:

2.1 Corporate social responsibility and value-added measures

As per the first school of thought, [Lee and Park \(2010\)](#), [Harjoto and Laksmana \(2018\)](#) showed a positive relationship between CSR and VAM. [El Ghoul et al. \(2017\)](#) claimed that CSR helped reduce transaction costs and facilitated access to resources, thereby improving competitive advantage of firms. With a sample of 2,445 firms from 53 countries over the period 2003–2010, they found that CSR was more positively related to firm value in countries with weaker market institutions. Similarly, the relationship between CSR and firm value is weakened for firms with higher advertising intensity as CSR by these firms gains negative stakeholder responses ([Hu et al., 2018](#)). [Fernández-Guadaño and Sarria-Pedroza \(2018\)](#) found that CSR positively related to the value creation for shareholders of large organizations but is needed to be implemented in small and medium-sized organizations more comprehensively. Managers with specific knowledge and training of CSR become more concerned about the company's reputation, brand image and its financial value ([López-Pérez et al., 2017](#)). [Byun and Oh \(2017\)](#) and [Ender and Brinckmann \(2019\)](#) depicted that the media coverage of CSR activities of a company positively influences and enhances the shareholder value. Firms with higher level of CSR earn higher returns than their competitors by spending more in advertising as it enhances firms' reputation in the market ([Assaf et al., 2017](#)).

In contrast, [Manchiraju and Rajgopal \(2017\)](#) examined whether CSR creates shareholders' value and found that on an average, the law of at least 2% spent on CSR activities caused a 4.1% drop in the stock price of firms forced to spend money on CSR. [Singh et al. \(2017\)](#) assessed 42 firms of Hong Kong and China. They supported the belief that the market considers investments in environmental programmes as costs instead of possibly beneficial programmes, probably because of firms' failure to effectively communicate the positive effects of their environmental initiatives to their investors. [Miralles-Quirós et al. \(2019\)](#) observed a negatively significant relationship between CSR and shareholder value creation of banks as the stakeholders pressurize the banks to acclimate their management systems and integrate environmental aspects. [Daszyńska-Zygadlo et al. \(2016\)](#) also depicted that CSR has a negative effect on VAM.

[Chen and Lee \(2017\)](#) inferred that investment in CSR does not increase company value until it outdoes the value transition threshold. [Zhang et al. \(2017\)](#) find that market react to firm's responsible and irresponsible CSR activities differently. The stock market does not reward socially responsible acquirers, but it judges investments by socially irresponsible firms more negatively. [Mulyadi and Anwar \(2012\)](#), [Gherghina and Vintilă \(2016\)](#), [Hafez \(2016\)](#) and [Fernández-Guadaño and Sarria-Pedroza \(2018\)](#) find out that there is no significant relationship between CSR and VAM. Henceforth, the study leads to the following hypothesis:

H1. CSR has a significant (positive/negative) impact on VAM.

2.2 Corporate social responsibility and profitability measures

[Kapoor and Sandhu \(2010\)](#) examine the impact of CSR on corporate financial performance (CFP) of 93 companies operating in India. A significant positive impact of CSR on profitability was observed, thereby demonstrating that more consideration of CSR arenas may provide competitive lead by improving firm's profitability. [Resmi et al. \(2018\)](#) revealed, from the sample of four renowned agribusiness industries, that the firms which prefer CSR generate high returns on equity and net income that contribute in their better FP. [Abilasha and Tyagi \(2019\)](#) revealed that better FP may lead to improved CSP and also better CSP may lead to improved FP, *ceteris paribus*. [Wu et al. \(2020\)](#) found a significant positive relationship between CSR and FP of stable firms as corporate stability enhances the role of CSR in endorsing CFP. Proper attention of a company for the social well-being of its locality may positively lead to generate more returns to it in terms of profits ([Nnenna and Carol, 2016](#)). [Byun and Oh \(2017\)](#) also depicted that the media coverage of CSR activities of a company positively influences and enhance its operating performance. Other authors who found a significant positive relationship between CSR and profitability in their respective studies are [Awan and Saeed \(2015\)](#), [Hafez \(2016\)](#), [Xu and Zeng \(2016\)](#), [Min et al. \(2017\)](#), [Brogi and Lagasio \(2018\)](#), [Maqbool and Zameer \(2018\)](#), [Rehan et al. \(2018\)](#) and [Li et al. \(2019\)](#).

In contrast, [Chen et al. \(2018\)](#) inferred that disclosure of CSR, as mandated by Indian CSR regulations of the Companies Act 2013, in annual reports subsequently experience a decrease in profitability. [Mukherjee et al. \(2018\)](#) revealed that companies who started spending on CSR activities (for which CSR spending is compulsory) after the introduction of mandatory CSR regulation showed a negative relationship between CSR expenditure and their profitability, indicating that more expenditure does not yield profits to these companies. [Babalola \(2012\)](#), [Folajin et al. \(2014\)](#) and [Sekhon and Kathuria \(2019\)](#) found a negative impact of CSR on FP in India. They claimed the more expenditure on CSR may lead to destruction of shareholders value.

[Lee and Park \(2010\)](#) found no statistical evidence that CSR has any impact on accounting performance of airline companies both in current and long-term periods. [Matuszak and Rózańska \(2019\)](#) exhibited no significant relationship between CSR and FP amongst Polish banks. [Akinleye and Faustina \(2017\)](#) did not find any significant (positive/negative) relationship between CSR and profit after tax of multinational companies due to less dedication and expenditure on CSR engagement. [Mulyadi and Anwar \(2012\)](#) and [Kiran et al. \(2015\)](#) also found that CSR has a neutral impact on profitability of the companies. Therefore, we expect the following hypothesis:

H2. CSR has a significant (positive/negative) impact on PM.

2.3 Corporate social responsibility and market measures

[Daszyńska-Zygadlo et al. \(2016\)](#) examined CSR behaviour of 2,428 companies from all over the world from 2009 to 2012 and revealed a positive impact of CSR on FP demonstrated by increasing both Tobin's q and PE ratio, which indicated that social actions can increase the return earned beyond the cost of capital. [Maqbool and Zameer \(2018\)](#) employed a panel data set of 28 Indian commercial banks for 10 years and revealed that CSR positively impacts stock returns. [Srivastava \(2019\)](#) observed that with the increase in CSR, both the company's reputation and brand image enhance. However, [Brammer et al. \(2006\)](#) conducted a study of UK quoted companies by measuring stock returns, exhibiting that firms with higher social performance scores tend to achieve lower returns, while firms with the lowest possible corporate social performance (CSP) scores of 0 outperformed the market.

[Wang et al. \(2011\)](#) found that institutional investors are more concerned about the CSR performance of listed companies than that of individual investors as they distinguished their investment policies between firms with different CSR performances. [Arx and Ziegler \(2008\)](#)

revealed that the industry’s environmental and social performance has no robust influence on the average monthly stock returns between 2003 and 2006 in any region. Landi and Sciarelli (2019) have also not found any significant relationship between CSR and stock market returns. Thus, we state the following hypothesis:

H3. CSR has a significant (positive/negative) impact on MM.

2.4 Corporate social responsibility and growth measures

Prior studies showed positive or no relation between CSR and GM. Awan and Saeed (2015) and Paul and Devi (2016) have proved the fact that the firms with high involvement in CSR activities get better reputation, improved sales and enhanced profitability above and beyond satisfying the customers. Assaf *et al.* (2017) also found a positive and significant relationship of CSR with sales and advertising expenses in hotel and restaurant industries. The firms with higher level of CSR enjoy more sales with less advertising expenses, which contribute in overall growth of the firm. Kapoor and Sandhu (2010) and Wu *et al.* (2020) do not find any significant relationship between growth and CSR, which probably negatively influences the investors’ decision of spending in firms. According to this, we state the following hypothesis:

H4. CSR has a significant (positive/negative) impact on GM.

Most of the studies under review have been conducted on the impact of CSR on FP of developed countries. A few studies are conducted on this issue in India, but no study has investigated the impact of CSR on FP of Indian steel industry. As steel industry is one of the leading manufacturing industries of India and is actively participating in CSR practices, this motivates us to conduct a study on this topic.

3. The database and the methodology

3.1 The sample

By using purposive sampling techniques, top 40 steel companies (on the basis of their market capitalization) have been selected as the sample from the BT-500 index, following the selection criteria shown in Table 1.

3.2 The period

The Ministry of Steel of the Government of India had initially introduced the National Steel Policy in 2005. Due to this, a period of 14 years starting from 2004–2005 to 2017–2018 has been chosen for the study.

3.3 Selection of variables

We have used three types of variables for the research study:

Total number of companies in the BT 500 index	500
Less: companies of various sectors except steel companies	(456)
Less: companies not complying with the following selection criteria, i.e.	(4)
(1) Market capitalization of the company should be more than 1 bn,	
(2) The company should be listed and	
(3) Data should be available from 2004–2005 to 2017–2018	
Final sample size	40
Note(s): <i>The sampling technique:</i> purposive sampling (non-probability technique)	

Table 1.
Sample selection
criteria

3.3.1 Dependent variables. On the basis of previous research, FP has been taken as a dependent variable (Kapoor and Sandhu, 2010; Maqbool and Zameer, 2018; and Abilasha and Tyagi, 2019). There is no consensus on the measurement of FP (Maqbool and Zameer, 2018). Different authors used different dimensions for defining FP, some have used VAM, while others have used PM, MM and GM. Different variables have been used for measuring these dimensions.

On the basis of the above table, finally we have selected all four major dimensions as predictors of FP. For VAM, we have used economic value added (EVA) and market value added (MVA). For profitability measures, return on total assets (ROTA), return on equity capital (ROEC), net profit (NP) and earnings per share (EPS) have been used because these are consistently claimed to be authentic measures of FP, for MM, stock market returns (SMR) and price earnings ratio (PER) and for GM, growth in sales (GIS) and growth in assets (GIA) have been used. For these dimensions, four different panel regression models have been designed.

3.3.2 The independent variable. CSR has been chosen as an independent variable as it is one of the major variables which may affect the FP of a firm (Kapoor and Sandhu, 2010). To measure CSR, data about the CSR activities performed by selected companies have been categorized into 12 groups, as defined under the Companies Act 2013. After that, the technique of the content analysis has been applied on the data extracted from annual reports (of 2017–2018) and individual websites of the companies to measure CSR in terms of CSR scores (Kapoor and Sandhu, 2010; Maqbool and Zameer, 2018). Score 1 has been assigned if a particular activity was disclosed by a company and 0 was assigned if not disclosed. Then these scores are summed up for individual companies. After that, CSR percentage has been measured by transforming scores through following formulae:

$$\text{CSR score of a company} = \frac{\text{No. of CSR activities performed by a company}}{\text{Total No. of CSR Activities}} \times 100$$

3.3.3 Control variables. Besides this, there are some other factors which may affect the FP of companies directly or indirectly. Considering the literature, other variables, namely, age, size and risk have been selected as control variables because without controlling their confounding effects, the CSR–FP link cannot be gauged appropriately (Mishra and Suar, 2010). We have used total assets to determine firm size as used in previous studies. Company age (AGE) has been calculated by the number of years since incorporation of a company until the date for which data are incorporated. As proxy of risk, we have used the debt-to-equity ratio. We have transformed size and age (by taking their logarithm) to improve normality and linearity of variables (see Table 2 and 3).

3.4 Sources of data

The study is purely based on secondary data collected from the annual, sustainability and CSR reports and official websites of the companies. Similarly, data for all the dependent and control variables have been collected from Prowess Database of Centre for Monitoring Indian Economy Pvt. Ltd (CMIE), moneycontrol.com.

4. The panel regression model

The present study is about examining the relationship of CSR on four dimensions of FP, namely, CSR-VAM, CSR-PM, CSR-MM and CSR-GM. The composite variables for all these four dimensions are taken as dependent and CSR is considered as an independent variable for constructing the model. Age, size and risk are the control variables of the study. The models for the study are as follows:

$$\text{VAM}_{it} = \beta_0 + \beta_1 \text{CSR}_{it} + \beta_2 \text{AGE}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{RISK}_{it} + \varepsilon_{it} \quad (1)$$

Dimensions	Variable	Authors
1. Value-added measures	I. Economic value added (EVA) II. Market value added (MVA)	Kang <i>et al.</i> (2010), Mulyadi and Anwar (2012)
3. Profitability measures	I. Return on total assets (ROTA) II. Return on equity capital (ROEC) III. Net profit (NP) IV. Earnings per share (EPS)	Waddock and Graves (1997), Kang <i>et al.</i> (2010), Mishra and Saur (2010), Mulyadi and Anwar (2012), Mujahid and Abdullah (2014), Hafez (2016), Abilasha and Tayagi (2019) Mulyadi and Anwar (2012) Mujahid and Abdullah (2014)
7. Market measures	I. Stock market returns (SMR) II. Price earnings ratio (PER)	Hafez (2016), Maqbool and Zameer (2018)
9. Growth measures	I. Growth in sales (GIS) II. Growth in assets (GIA)	Kapoor and Sandhu (2010), Mulyadi and Anwar (2012) Kapoor and Sandhu (2010)

Table 2.
Selection of dependent variables form various studies

Variable	Authors
Size	Kapoor and Sandhu (2010), Hafez (2016), and Maqbool and Zameer (2018)
Age	Kapoor and Sandhu (2010) and Maqbool and Zameer (2018)
Risk	Waddock and Graves (1997), Kapoor and Sandhu (2010), Hafez (2016) and Maqbool and Zameer (2018)

Table 3.
Selection of control variables from various studies

$$PM_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 AGE_{it} + \beta_3 SIZE_{it} + \beta_4 RISK_{it} + \varepsilon_{it} \quad (2)$$

$$MM_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 AGE_{it} + \beta_3 SIZE_{it} + \beta_4 RISK_{it} + \varepsilon_{it} \quad (3)$$

$$GM_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 AGE_{it} + \beta_3 SIZE_{it} + \beta_4 RISK_{it} + \varepsilon_{it} \quad (4)$$

β_0 is the constant and β_1 – β_4 are the parameters for independent and control variables. ε_{it} is the error term.

5. The empirical analysis and results

We have used Excel 2016 software for the descriptive analysis, SPSS 20 software for correlation, the factor analysis and MANOVA and EViews 10 software for model estimation of the panel regression analysis. Table 4 depicts the descriptive statistics of various variables selected for the study. The mean value of CSR is 0.61 and standard deviation is 0.25. The results represent that CSR has acquired roots in India, as average amounts to 61%, but it still needs to be explored more before recognizing it as a strategic component of the business (Maqbool and Zameer, 2018).

5.1 The composite index of performance

With the aim to complete our present analysis, all the diverse problems are considered and we have tried to reduce them by using the composite index of performance. A factor analysis is applied to frame a composite list. The presumptions in regards to factor values have been

Table 4.
Descriptive statistics

Variables	Mean	Maximum	Minimum	Std. dev	Observations
EVA	7.13	11.90	-4.60	2.71	560
MVA	8.61	13.814	0	2.11	560
EPS	15.56	18.9	-17.12	86.24	560
NP	0.03	0.40	-1.97	0.15	560
ROEC	0.26	87.59	-12.50	3.97	560
ROTA	0.04	0.61	-0.44	0.09	560
SMR	0.42	16.46	-0.84	1.63	560
PER	6.82	51.60	-62.28	9.59	560
GIA	0.18	5.11	-0.40	0.40	560
GIS	0.21	28.60	-0.92	1.38	560
CSR	0.61	1.21	0	0.25	560
AGE	3.25	4.69	1.09	0.55	560
SIZE	9.77	13.24	5.97	1.36	560
RISK	1.50	63.03	-76.28	5.76	560

checked and effectively met. The primary prerequisite is a high relationship between the factors. The correlation grid (Table 5) depicts the financial variables, which portrays extremely associated (EVA, MVA, EPS, NP, ROEC, ROTA, SMR, PER, GIA and GIS) at the 0.05% degree of significance.

Consequently, Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity values are 0.802 and 5,629.03, respectively, which are extremely good and suitable for the factor analysis.

The index covered all four factors with eigenvalues exceeding 1, explaining 77.551% of the variance. The result extracted four factors and their eigenvalues, respectively, i.e. VAM: 3.689, PM: 1.651, MM: 1.235 and GM: 1.091 (as given in Table 6). All these factors have explained adequate quantity of variance in the results. Hence, all the parameters which required completing the factor analysis are matched with reliability and validity.

As a result to measure FP, we need to calculate F and Z factors, whereas F is the factor score of coefficient matrix (shown in Table 7) and Z is the vector of standardized values of the performance indicators (EVA, MVA, EPS, NP, ROEC, ROTA, SMR, PER, GIA and GIS), which have been factor analysed (Rummel, 1970). All four factors have been considered i.e. VAM = F.Z, PM = F.Z, MM = F.Z and GM = F.Z.

Where Z1, Z2, Z3, Z4, Z5, Z6, Z7, Z8, Z9 and Z10 signify the normalized estimations of EVA, MVA, EPS, NP, ROEC, ROTA, SMR, PER, GIA and GIS, respectively. Consequently, Z1 (EVA of company "1" minus average EVA of all companies considered) divided by standard

Table 5.
The correlation grid

Correlation	EVA	MVA	EPS	NP	ROEC	ROTA	SMR	PER	GIA	GIS
EVA	1.000									
MVA	0.351*	1.000								
EPS	0.195*	0.205*	1.000							
NP	0.218*	0.433*	0.294*	1.000						
ROEC	0.008*	0.060*	0.010	0.185*	1.000					
ROTA	0.285*	0.345*	0.429*	0.689*	0.051*	1.000				
SMR	0.019*	0.109*	0.063*	0.121*	0.060*	0.163*	1.000			
PER	0.059	0.084*	0.004	0.177*	0.062*	0.134*	0.088*	1.000		
GIA	0.175*	0.124*	0.190*	0.198*	0.011*	0.199*	0.088*	0.045*	1.000	
GIS	0.005	0.031	0.034	0.113*	0.007	0.106	0.023	0.074*	0.194*	1.000

Note(s): *correlation significant ($p < 0.05$)

Variables	VAM (F1)	PM (F2)	MM (F3)	GM (F4)
EVA	0.932			
MVA	0.912			
EPS		0.884		
NP		0.879		
ROEC		0.931		
ROTA		0.788		
SMR			0.847	
PER			0.722	
GIS				0.746
GIT				0.823
Eigenvalue	3.689	1.651	1.235	1.091
% variance	44.568	15.236	11.206	6.541
Cumulative % variance	44.568	59.804	71.010	77.551
Scale reliability alpha (Cronbach's alpha)	0.879	0.849	0.834	0.821

Note(s): Cronbach's alpha = 0.812, Kaiser-Meyer-Olkin measure of sampling adequacy = 0.802, Bartlett's test of sphericity (approx. chi square = 5629.038, DF = 173, sig = 0.00)

Table 6.
The factor analysis

Variables	F1	F2	F3	F4
EVA	0.412	0.019	0.012	0.002
MVA	0.377	0.003	0.024	0.005
EPS	0.011	0.506	0.011	0.018
NP	0.016	0.522	0.003	0.016
ROEC	0.007	0.355	0.017	0.021
ROTA	0.021	0.374	0.001	0.017
SMR	0.018	0.006	0.676	0.006
PER	0.010	0.014	0.686	0.010
GIA	0.009	0.022	0.025	0.625
GIS	0.013	0.015	0.002	0.632

Table 7.
The factor score
coefficient matrix of
performance variables

deviation of average EVA for all companies. Following a similar strategy, we ascertain Z2, Z3, Z4, Z5 Z6, Z7, Z8, Z9 and Z10. Later, we have ascertained the composite values of VAM, PM, MM and GM.

5.2 Panel model results

Before applying the panel regression models, we have checked the autocorrelation, multicollinearity and stationarity of the selected variables. All the variables are stationary at levels as depicted by the augmented Dickey–Fuller (ADF) test. No autocorrelation problem was observed as indicated by Durbin–Watson statistics values that ranged between 1 and 3 in all models. Variance inflation factor (VIF) values are much lower than 10, indicating that the multicollinearity does not exist amongst the independent variables. The White procedure is applied in model estimation to ensure that coefficients are not heteroscedastic.

We used three alternative pooling techniques i.e. ordinary least square (OLS), fixed and random effects to select the most appropriate regression models for our four different dimensions of FP, i.e. VAM, PM, MM and GM. First of all, we applied OLS for all models. However, OLS does not anticipate the firm- or time-specific effects. Therefore, the redundant fixed effects test has been applied to test the significance of the effects. But in all models, the results of this test indicated that $p < 0.05$ and concluded that OLS is not best for the model. In

the next step, both fixed and random effect models have been estimated differently. Now to choose between fixed or random effects for cross section, the Hausman test has been applied with a null hypothesis as “random effects are appropriate”. The test revealed that the $p < 0.05$ in model 1 (VAM) and model 2 (PM) (Table 7), indicating that fixed effects will give the best results for these models. However, in model 3 (MM) and model 4 (GM), the results of the Hausman test are insignificant, therefore favouring application of random effect specifications for these two models.

5.3 The multivariate analysis

We have also applied multivariate and univariate analysis of variance (ANOVA). MANOVA is an extended version of ANOVA, which includes more than one dependent variable. It is a dependence technique that assesses the variances for two or more metric-dependent variables on the basis of some categorical independent variables (nonmetric) (Joseph et al., 2010).

In consonant with ANOVA, MANOVA is also slanted towards variances between groups (or experimental treatments). ANOVA is a univariate procedure used for measuring the group variances on one metric-dependent variable only. While MANOVA is a multivariate procedure as it is used to evaluate the group variances amongst multiple metric-dependent variables concurrently. In MANOVA, each experimental treatment is examined on two or more dependent variables (Joseph et al., 2010). Before running the test, all the assumptions of MANOVA and univariate ANOVA have been met. The details about results are discussed in the next part.

6. Discussion

Table 8 provides that the results of all four models indicated the value of R^2 as 0.69, 0.60, 0.41 and 0.28, respectively. According to this, the selected variables explain 69, 60, 41 and 28% of

Dependent / independent variable	Model I VAM	Model II PM	Model III MM	Model IV GM
Panel data model type	Fixed	Fixed	Random	Random
C	2.223(4.490)***	2.105(4.964)***	0.895(2.080)**	0.956(1.504)**
CSR	0.817(1.567)*	0.569(1.915)**	0.181(0.751)	0.275(2.642)***
Age	-0.326(-1.772)*	-0.257(-0.535)	0.031(0.248)	-0.134(-1.646)*
Size	0.168(3.649)***	0.406(2.695)***	-0.060(-1.320)	0.246(2.832)***
Risk	-0.005(-1.129)	0.006(0.825)	-0.033(-1.773)*	0.000(0.025)
R^2	0.69	0.60	0.41	0.28
Adjusted R^2	0.66	0.56	0.35	0.20
F-test	20.04***	13.60***	6.05***	3.51***
DW statistics	1.66	1.54	1.93	2.07
Hausman Test	133.208***	120.115***	6.508	5.518
Redundant fixed effect test	419.612***	463.933	153.541***	126.619***
Collinearity VIF	1.29	1.69	1.05	1.08
Unit root test (ADF)	170.392***	148.633***	126.037***	129.38***
Total observations	560			

Note(s): (1) standardized beta coefficients are provided. T-ratios are presented in parentheses. (2) Average of VIF has been used to find collinearity^{VIF} for checking the serial correlation (Maqbool and Zameer, 2018). (3) The Durbin–Watson test showed no autocorrelation amongst the variables. (4) F-test showed fitness of the model. (5) The Hausman test was used to choose amongst random and fixed effects for model. (6) Significant at * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. (7) Augmented Dickey–Fuller (ADF) shows data are stationary and there is no unit root in the data

Table 8. Results of panel data regression models

aggregate data, respectively, and the remaining part is explained by other variables which are not the part of the study. *F*-statistic is found to be significant at the 1% confidence level. Thus, the above indicators claim that the panel regression models for measuring the impact of CSR on FP are statistically fit and valid too. Models 1, 2 and 4 depict that CSR explains 82% change in firm value, 57% change in profitability and 27% change in the growth, respectively. As per our study, stock market returns are not affected by CSR.

The result of model 1 indicated the significant ($p < 0.05$) positive impact of CSR on VAM, supported H1 and is in consonance with Kim and Kim (2014), Harjoto and Laksmana (2018) and Hu *et al.* (2018). The results proclaimed that CSR is a valuable and rare resource that can be exploited to create competitive advantages of company over its rivals by increasing EVA and MVA through reducing transaction cost. This model also supports signalling theory, which shows that CSR is a positive symbol for FP of a company. A company which is more involved in CSR activities can send positive signals to its various stakeholders, such as shareholders, creditors, government authorities, etc. which probably benefit from its FP in many different ways (Wu *et al.*, 2020).

As per model 2, CSR also showed a significant positive relation with PM and the results are consistent with H2 and similar to Kapoor and Sandhu (2010), Mishra and Suar (2010), Xu and Zeng (2016) and Maqbool and Zameer (2018). Companies with more CSR activities may get more tax deductions and better asset management, which will lead to decrease in cost of capital and increase in profitability. It also supports stakeholders theory with the assumption that if CSR is improved in a company that will lead to enhancing relationship with its stakeholder that results in better profitability (Khojastehpour and Johns, 2014).

Conversely, the results of model 3 are contradictory to H3, exhibiting no relationship between CSR and MM as $p > 0.10$. Our finding is in conformity with Wang *et al.* (2011) and Arx and Ziegler (2008). This probably indicates that the investor may not get required return for their investment in short run due to the time frame of CSR activities. The costs on CSR are incurred immediately, whereas returns are not realized promptly. While supporting neoclassical economic theory, which considers the neutral relationship between CSR and MM, the model depicted that by investing more in CSR activities, companies incur more direct cost that contribute in competitive disadvantage amongst their related peers (Sekhon and Kathuria, 2019).

However, model 4 also showed a significant positive impact of CSR on GM (Wang, 2011; Awan and Saeed, 2015; Paul and Devi, 2016; Assaf *et al.* (2017)). This model also supported the H4 as $p < 0.01$. The companies which are highly involved in CSR activities get better reputation, improved sales and prices and enhanced profitability above and beyond satisfying the customers. By sustaining social identity and customers' inference-making theories, the model inferred that the increase in CSR activities of a firm results in improving reputation and enhances customers' awareness about its products that leads to increase in sales revenue and overall growth of the firm (Awan and Saeed, 2015).

Tables 9 and 10 present both the MANOVA and univariate ANOVA results with regard to CSR. The results of MANOVA in Tables 9 and 10 also indicate that CSR has a significant impact on FP. MANOVA results specified that an overall group difference was present

	Value	<i>F</i>	Sig
Pillai's trace	1.087	1.652	0.000
Wilks' lambda	0.267	1.723	0.000
Hotelling's trace	1.639	1.796	0.000
Roy's largest root	0.732	3.243	0.000

Table 9.
The multivariate
analysis

(Wilks' lambda = 0.067, $F = 1.723$, $p < 0.000$). Wilks' Lambda multivariate tests are considered as the highest level of power for the sample in comparison to the other multivariate tests (Mukherjee and Nuñez, 2019). The overall MANOVA test was statistically significant at the 0.01 level, indicating that CSR has a significant relationship with all the four dimensions of FP.

Univariate ANOVA tests were statistically significant for VAM, PM and GM. CSR was not found to predict MM in this study as there is no significant relationship between two notions. The result of Table 10 revealed that CSR has the most affirmative impact on VAM having highest significant F -value (2.551) and R^2 (0.466), followed by PM (F -value: 2.463, R^2 : 0.457, $p < 0.01$) and GM (F -value: 0.836, R^2 : 0.259, $p < 0.05$). There was no prior literature related to conducting multivariate and univariate analyses for measuring the impact of CSR on FP. So, these results can also be considered as predominant. But these results are extracted from various studies in which MANOVA and univariate ANOVA have already been applied (Wahid *et al.*, 2017; Mukherjee and Nuñez, 2019). The results also confirm that companies involved more in CSR projects are capable not only to generate higher returns to their shareholders but also can increase sales of their product by increasing demand that most probably lead to enhanced profitability and overall growth.

7. Conclusion and implications

CSR may be defined as business contribution to sustainable development, which ensures appropriate return to shareholders and employees, better quality of products and services to customer as well as overall welfare of the society. Indian steel industry, being one of the largest producers in the world, has contributed in different social activities. No study, in particular, has been done on such topic so far, which made us to consider this as sound topic to pursue. By using empirical methods, we tried to test the impact of CSR on FP of Indian steel industry. This study gains its importance as the first research study that examines this connotation in this sector. Consequently, our results should be regarded as provisional and preliminary.

The results of prior studies are inconclusive, which creates field for further investigation. We have explored four dimensions to calculate FP, namely, VAM, PM, MM and GM. Age, size and risk were elected as control variables. The result indicates CSR positively impacts firm value (shareholders wealth creation in long run) profitability and growth (in term of sales and assets). But the study shows no relationship between CSR and stock returns, which probably implies that investor may not get prompt returns from their investment but in the long run it will provide better return surely. Moreover, these results confirm that companies investing in CSR activities are proficient to generate higher returns to their shareholders, can raise their sales by increasing demand for products that perhaps enhance profitability and overall development of the companies.

Dependent variable	Type III sum of squares	df	Mean square	F	Sig
VAM	91.733 ^a	103	0.891	2.551	0.000
PM	150.184 ^b	103	1.458	2.463	0.000
MM	96.244 ^c	103	0.934	0.901	0.738
GM	85.343 ^d	103	0.829	0.836	0.002

Note(s): a. $R^2 = 0.466$ (adjusted $R^2 = 0.422$)

b. $R^2 = 0.457$ (adjusted $R^2 = 0.412$)

c. $R^2 = 0.269$ (adjusted $R^2 = 0.119$)

d. $R^2 = 0.259$ (adjusted $R^2 = 0.031$)

Table 10.
The univariate
analysis of variance

Our study contributes to international literature on the CSR–FP relationship because we have chosen Indian steel industry, an emerging market where such kind of research is still absent. Finally, we believe that this paper might have implications for managers, investors and other stakeholders. CSR is ultimately an investment decision. Therefore, CSR should be included in the main business strategy by managers rather than considering it as an optional activity for long-run existence. If CSR is pertinently incorporated into the business operations, it will result in better FP by making both social and financial targets easier. Moreover, companies with higher CSR rating create a brand image and positive reputation amongst customers and can also attract proficient employees and business partners. These companies may get greater profit, loyal customers and have less possibility of bribery and corruption. The one vital implication of this study is the significance of voluntary initiatives. Companies should take initiative for CSR voluntarily rather than taken under legislative compulsions. Besides, forcing companies do not essentially indicate that they will respond advantageously and go beyond legislation requirements if they do not recognize a certain opportunity from doing this. This study may result being influential to companies confined to not only this sector but also reaching to the others, inspiring them to contribute their share of profit for the welfare of society. Furthermore, government should ensure compliance of CSR policies by setting mechanisms for its implementation. The Securities and Exchange Board (SEBI) should take severe actions for increasing CSR disclosure practices. Government should also adopt such measures that observe companies' fair investment in CSR to avoid corruption of showing high costs on paper to get tax benefits deprived of giving anything back to the society. It is recommended that the companies should contribute for betterment of the society along with their growth.

This study contains certain limitations. Firstly, we have used a limited sample of 40 listed companies from one industry and the time frame of 14 years. Further research can be done with large number of companies (including unlisted companies) from different sectors with most recent data to obtain a more valid result. Secondly, we have used binary numbers to measure CSR scores (whether performing CSR activities or not), which do not reveal that how well the socially responsible activities are conducted by the companies. So, with the availability of data, it would be interesting to estimate the effects of the particular CSR activity on FP of the companies in future research. Moreover, a study can be conducted on comparison between factors affecting CSR initiatives in developed and developing countries. The non-financial aspect has been totally ignored in this study and may be considered in future research. Generally, the method of assessing dependent, independent and control variables could be modified or diversified to improve our discoveries.

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The impact of
CSR on
financial
performance

151

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