Original Article

Is Corporate Social Responsibility Worth the Cost? Evaluating Financial Performance in the Indian Energy Sector

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Abstract

This study examines the impact of corporate social responsibility (CSR) on financial performance in the Indian energy sector from 2014–2015 to 2023–2024. The research uses a cost-benefit analysis to evaluate whether the financial investments made by firms in CSR activities yield financial gains. The research uses secondary data sourced from annual reports and the Prowess database of 23 energy firms that are part of the S&P BSE Energy index. Financial performance is measured using Return on Assets (ROA), Return on Capital Employed (ROCE), and Return on Equity (ROE), with additional control variables including firm age, size, and risk. Panel regression techniques such as the Random Effects Model (REM) and the two-step System Generalized Method of Moments are applied for data analysis, with the Hausman test confirming the consistency of the REM. The results highlight a statistically significant negative impact of CSR spending on ROA, ROCE, and ROE, even when accounting for lagged effects, suggesting that CSR allocations may impose short-term financial costs before potential long-term benefits emerge. These findings offer critical insights for policymakers and corporate strategists in the energy sector, underscoring the need to design CSR implementation strategies that balance compliance with future value creation.

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Introduction

Corporate social responsibility (CSR) has emerged as a critical strategic pillar for businesses striving to align stakeholder expectations with long-term sustainability and competitive advantage. From being considered a peripheral obligation, CSR has evolved into a central component of business operations and reputation management in an increasingly conscious and regulated world (Mitra, 2021). This shift has been particularly salient in sectors with substantial environmental and social externalities, such as the energy sector, which attracts both regulatory scrutiny and public accountability (Liu et al., 2022).

The energy sector encompasses a broad spectrum of operations, including fossil fuel-based utilities, renewable energy initiatives, and infrastructure-intensive distribution systems. Each sub-sector operates under distinct constraints and opportunities for implementing CSR strategies. Environmental sustainability remains a defining concern, specifically emissions control, biodiversity, and water resource management (Khan et al., 2021). Simultaneously, firms must address social equity issues in affected communities through inclusive employment, regional development, and fair labor practices (Vuong & Bui, 2023). Good governance practices, transparency, and ethical leadership are increasingly demanded by investors and regulators, reinforcing CSR's role in risk management and stakeholder trust (Clementino & Perkins, 2021).

Globally, CSR has become instrumental in reinforcing brand equity, managing operational risks, and engaging stakeholders. Companies are integrating environmental, social, and governance (ESG) metrics into their reporting frameworks and aligning CSR practices with standards such as the Global Reporting Initiative (GRI) and the United Nations Sustainable Development Goals (SDGs) (Ahmad et al., 2024). This strategic alignment fosters long-term business resilience and positions CSR as a value-creating tool.

In the Indian context, CSR attained a statutory dimension through the enactment of the Companies Act, 2013. According to Section 135 of the Act, companies with a net worth of ₹500 crore or more, turnover of ₹1,000 crore or more, or net profit of ₹5 crore or more are mandated to allocate 2% of their average net profit from the previous three years to CSR activities. This legal framework has catalyzed CSR initiatives in domains like education, healthcare, sanitation, rural upliftment, and environmental conservation (Garg & Agarwal, 2022). Indian firms increasingly employ CSR to address regional disparities, build local legitimacy, and strengthen community relations (Pfajfar et al., 2022).

The Indian energy distribution sector, however, presents a unique CSR landscape. Unlike energy generation companies, distribution companies face consumer-end challenges such as last-mile connectivity, energy theft, and public dissatisfaction with service quality. They operate within a tightly regulated environment with capped tariffs and mandatory electrification targets, which limit profit margins. Despite this, their CSR obligations remain substantial. Understanding how CSR initiatives affect their financial outcomes under these constraints remains underexplored in academic research. Theoretical perspectives offer varying insights into how CSR may impact firm performance. Stakeholder Theory suggests that firms addressing the interests of diverse stakeholder groups, including communities, regulators, and employees, may realize improved long-term outcomes (Beldad et al., 2020; Freeman, 1984). The Resource-Based View (RBV) argues that intangible assets such as reputation, employee loyalty, and legitimacy derived from CSR constitute a competitive advantage (Barney, 1991; Vuong & Bui, 2023). Recent studies have empirically validated these views by linking CSR to customer retention, improved compliance, and better access to capital (Bag & Omrane, 2022; Lu et al., 2019; Sarfraz et al., 2023). However, these linkages are often conditional on firm characteristics, industry type, and the time horizon of CSR benefits.

Despite extensive research on CSR and firm performance across sectors, few studies have focused exclusively on Indian energy distribution companies. Prior studies have either aggregated the energy sector (Shukla & Geetika, 2022) or focused on oil and gas segments (Govindarajan & Amilan, 2013). This article addresses this gap by analyzing panel data of Indian energy distribution firms and examining the long-term financial implications of CSR expenditure. The use of firm-level longitudinal data allows for deeper insights into lagged effects and structural constraints that short-term or cross-sectional studies may overlook. The study also incorporates theoretical insights from recent Indian literature, including Barman and Mahakud (2024), to better contextualize the regulatory and institutional environment.

Accordingly, this study aims to examine the impact of CSR expenditure on the financial performance (measured by Return on Assets [ROA], Return on Capital Employed [ROCE], and Return on Equity [ROE]) of Indian energy distribution companies. Assess whether firm-specific factors such as age, size, and leverage influence this relationship. Provide regulatory and sectoral insights into how CSR operates under mandatory compliance in constrained operational environments. To achieve these aims, the study seeks to answer the following research questions (RQs):

RQ1: Does CSR expenditure significantly affect the financial performance of Indian energy distribution companies?
RQ2: Do firm-specific variables (age, size, leverage) moderate the relationship between CSR and financial performance?
RQ3: How does the regulatory context of the Indian energy sector shape the CSR-performance linkage?

The remainder of this study is organized as follows: The second section, Literature Review, provides a comprehensive review of existing research on the

interconnectedness among variables. The third section describes the Data & Methodology, and the fourth section presents the Results and Interpretation. Finally, the Conclusion & Policy Implications and directions for future research are suggested in the fifth section.

Literature Review and Hypothesis Development

CSR Expenditure and Firm Performance

CSR has long been viewed as a strategic tool for aligning stakeholder expectations with long-term business goals. According to Stakeholder Theory (Freeman, 1984), firms must address the needs of diverse stakeholder groups to maintain legitimacy and competitiveness. The RBV (Barney, 1991) supports this argument, positing that CSR can serve as an intangible resource that strengthens a firm's reputation and trust.

Empirical research highlights the link between CSR expenditure and financial performance. For example, Bag and Omrane (2022) demonstrated that Indian corporations engaging in CSR activities witnessed improved financial returns. Similar evidence was observed by Coelho et al. (2023) and Sameer (2021), who found that CSR disclosure positively correlated with profitability in Vietnamese commercial banks. In the manufacturing sector, Sarfraz et al. (2023) highlighted CSR's role in long-term sustainability and operational efficiency.

Specific to the energy domain, studies have suggested that CSR is instrumental in navigating regulatory pressures and building community goodwill (Latapí Agudelo et al., 2020; Lu, 2019). The CSR initiatives of Estonian and Lithuanian utilities have significantly contributed to energy sustainability (Lu, 2019), and the "Masdar Initiative" in Abu Dhabi represents a landmark case of environmental CSR implementation (Mezher et al., 2010). Despite this broad consensus, CSR's impact remains context dependent. Studies such as those by Maqbool and Zameer (2018), Krunic (2017), and Ahmed (2018) reported no significant relationship or even negative associations between CSR and financial metrics. These inconsistencies underscore the need for industry-specific studies, particularly within regulated sectors like energy distribution in India.

- H_1: CSR expenditure significantly influences the ROA of Indian energy distribution companies.
- H_2: CSR expenditure significantly influences the ROCE of Indian energy distribution companies.
- H_3: CSR expenditure significantly influences the ROE of Indian energy distribution companies.

Firm Age and Performance

Firm age is often used as a proxy for organizational experience, structural maturity, and market embeddedness. Older firms may have established routines and

stakeholder networks, potentially improved financial resilience and enabled better CSR execution. However, mature firms may also face institutional inertia or legacy inefficiencies that reduce responsiveness.

Several studies have highlighted firm age as a relevant determinant of CSR and financial outcomes. For example, Gong (2023) found that older firms are more likely to integrate strategic CSR for long-term returns. Zhang and Liu (2023) further emphasized that internal governance mechanisms in older firms could mediate CSR effectiveness.

Firm Size and Performance

Larger firms typically have more resources to invest in CSR and more visibility, making them subject to greater stakeholder scrutiny. Their diversified portfolios may also reduce risks, allowing them to benefit from reputational gains via CSR (Homayoun et al., 2015; Pfajfar et al., 2022). On the other hand, CSR effectiveness may be diluted in very large firms due to bureaucratic complexities or weak stakeholder linkages at the grassroots. In a meta-analysis, Gurler (2024) identified firm size as a significant moderator in the CSR-performance linkage. Similarly, Dhanasekar et al. (2023) reported a positive correlation between firm size and CSR impact in Indian firms, while Kumar et al. (2024) discussed size as a critical factor in CSR-led competitiveness.

Firm Leverage and Performance

Capital structure is often cited as a moderating factor in the CSR-performance relationship. Highly leveraged firms may have less flexibility to allocate resources to CSR due to repayment obligations. Alternatively, firms with moderate leverage may use CSR to signal creditworthiness or stakeholder commitment (Latapí Agudelo et al., 2020; McWilliams & Siegel, 2000). Empirical studies offer mixed results. Nguyen et al. (2022) observed that leverage sometimes negates the benefits of CSR by constraining cash flow. Conversely, Barman and Mahakud (2024) found that CSR investments in group-affiliated firms with higher leverage still yielded positive returns due to improved stakeholder perception and trust.

While extensive research has examined CSR's influence on firm performance across sectors, there is limited consensus on the strength and direction of this relationship in regulated industries like energy distribution. Contextual variables such as firm size, age, and leverage appear to moderate these outcomes, but few studies explore these interactions comprehensively using panel data and sector-specific frameworks. Moreover, many existing studies fail to address the time-lagged effects of CSR expenditure, which may not yield immediate financial benefits but can enhance performance over time (Barman & Mahakud, 2024). This study contributes to the literature by examining the CSR-performance nexus within the Indian energy distribution sector, integrating multiple control variables and using longitudinal firm-level data to offer deeper insights into this complex relationship.

Data and Methodology

Data

The present research is based on secondary information, and the collected data pertain to 23 energy sector companies listed on the BSE, spanning from 2014–2015 to 2023–2024. Data concerning CSR, financial performance, and control variables were gathered from the annual reports of the listed companies and the Prowess database of the CMIE. To achieve a consistent panel data set, firms with incomplete data during the selected period were excluded from the sample, ensuring the availability of financial information. As a result, the initial sample of 30 firms was reduced to 23 (Table 1). Therefore, a balanced panel of 23 firms within the energy sector, covering a 10-year period from 2014–2015 to 2023–2024, formed the final sample size for this study.

Definition of Variables

This study investigates the impact of CSR expenditure on firm financial performance, using three key accounting-based performance metrics: ROA, ROCE, and ROE. These variables serve as the dependent variables, capturing the firm's profitability, operational efficiency, and shareholder return, respectively. CSR expenditure is the independent variable, operationalized as the actual CSR spending reported under the mandatory compliance requirement of the Indian Companies Act, 2013. As CSR initiatives often yield benefits that are not immediate, this study also incorporates a lagged specification of CSR to explore its long-term financial implications, in line with suggestions from prior empirical works (Barman & Mahakud, 2024; Maqbool & Zameer, 2018).

Table 1. List of Selected Companies.

Sr. No.	Company Name	Sr. No.	Company Name
1	Aegis Logistics Ltd.	13	Indraprastha Gas Ltd.
2	Bharat Petroleum Corporation Ltd.	14	Jindal Drilling & Inds. Ltd.
3	Castrol India Ltd.	15	Mahanagar Gas Ltd.
4	Chennai Petroleum Corporation Ltd.	16	Mangalore Refinery & Petrochemicals Ltd.
5	Coal India Ltd.	17	Oil & Natural Gas Corporation Ltd.
6	GAIL (India) Ltd.	18	Oil India Ltd.
7	Gandhar Oil Refinery (India) Ltd.	19	Panama Petrochem Ltd.
8	Gujarat Gas Ltd.	20	Petronet LNG Ltd.
9	Gujarat State Petronet Ltd.	21	Reliance Industries Ltd.
10	Gulf Oil Lubricants India Ltd.	22	Sandur Manganese & Iron Ores Ltd.
11	Hindustan Petroleum Corporation Ltd.	23	Savita Oil Technologies Ltd.

In addition, firm-specific control variables, namely age, size, and leverage, are included to mitigate omitted variable bias and capture heterogeneity in operational scale, maturity, and financial structure. These variables are commonly used in CSR-performance models and are grounded in both theoretical frameworks and empirical research. Firm Age serves as a proxy for organizational maturity and institutional knowledge. Older firms may benefit from more stable operations and stakeholder networks, which can influence both CSR adoption and financial outcomes (Gong, 2023; Zhang & Liu, 2023). Firm Size, measured by the natural logarithm of total assets, captures the firm's resource base and market visibility. Larger firms often have greater capacity for CSR and may experience stronger stakeholder scrutiny, affecting reputational benefits and financial efficiency (Dhanasekar et al., 2023; Pfajfar et al., 2022).

Leverage, calculated as total debt to total assets, reflects financial risk and capital structure. Highly leveraged firms may either avoid CSR due to liquidity constraints or adopt CSR strategically to improve creditworthiness and reduce cost of capital (McWilliams & Siegel, 2000; Nguyen et al., 2022). These control variables help to isolate the effect of CSR on financial performance and are not the focus of hypothesis testing. Table 2 outlines the operational definitions and measurement proxies used in this study.

CSR expenditure, especially under a mandatory compliance regime, is increasingly being examined as a policy-induced determinant of firm strategy and performance. However, its effects often materialize over time. As such, this study incorporates the one-year lagged value of CSR expenditure to assess delayed financial effects and better reflect the resource-based and stakeholder value accumulation processes noted in strategic CSR theory (Barman & Mahakud, 2024; Barney, 1991; Freeman, 1984).

Panel Regression Model

The study employs a panel data methodology, incorporating both cross-sectional and time series data. The regression model used to assess the influence of CSR

Table 2. Description of Variables.

Variable Type	Variables	Notation	Proxy/Measurement
Dependent variable	Return on assets	ROA	Net profit/total assets
	Return on capital employed	ROCE	EBIT/capital employed
	Return on equity	ROE	Net profit/total equity
Independent variable	Corporate social responsibility	CSR	CSR expenditure to be incurred as per the Companies Act 2013
Control variable	Company age	AGE	Number of years since establishment
	Company size	SIZE	Natural logarithms of total assets
	Company leverage	LEV	Total debt/total assets

spending on financial performance is outlined as follows:

Model I: ROA as a dependent variable

$$ROA_{it} = \beta_0 + \beta_1 CSR_{i(t-1)} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Lev_{it} + e_{it}$$

Model II: ROCE as a dependent variable

$$ROCE_{it} = \beta_0 + \beta_1 CSR_{i(t-1)} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Lev_{it} + e_{it}$$

Model III: ROE as a dependent variable

$$ROE_{it} = \beta_0 + \beta_1 CSR_{i(t-1)} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Lev_{it} + e_{it}$$

Where ROA: Return on Assets, ROCE: Return on Capital Employed and ROE: Return on Equity, respectively. β_0 is the constant; β_1 to β_4 are the coefficients of the independent variables. The subscripts signify the company and $CSR_{i(t-1)}$ signify lagged CSR expenditure (as per Companies Act 2013) to capture the delayed effects on performance and e_{it} is the error term.

To determine the appropriate model, either the Random Effects Model (REM) or the Fixed Effects Model (FEM), a Hausman test was conducted. The null hypothesis of the Hausman test assumes no correlation between the regressors and individual effects, suggesting that REM is appropriate. If rejected, FEM is preferred. The results (Table 4) indicated that REM was suitable. However, recognizing the potential issue of endogeneity, especially because CSR spending is a subset of profit and may simultaneously be influenced by performance, a two-step System Generalized Method of Moments (GMM) model was applied. The GMM estimator, commonly used in dynamic panel data analysis, addresses endogeneity by incorporating lagged dependent variables and instrumenting endogenous regressors (Arellano & Bover, 1995; Blundell & Bond, 1998). Thus, the use of GMM enhances robustness beyond altering model types and is appropriate for the dataset characteristics and research objectives.

Analysis and Interpretation

Descriptive Statistics and Correlation Matrix

Table 3 presents the descriptive statistics for all variables under study. The independent variable, CSR spending, has a mean of ₹1,071.08 lakhs and a standard deviation of ₹2,192.40 lakhs, indicating substantial variability in CSR contributions across energy sector firms. The wide dispersion suggests that while some firms invest significantly in CSR, others contribute minimally, implying that CSR spending is not uniformly prioritized but is gaining traction among larger or more socially responsible firms. Regarding financial performance, ROCE reports the highest average value at 22.28% (SD = 19.56), indicating strong efficiency in

Table 3. Descriptive Statistics.

Variables	Obs.	Mean	Maximum	Minimum	Std. Dev.
ROA	230	11.4173	77.61	−16.39	12.5524
ROCE	230	22.2764	110.67	−61	19.5565
ROE	230	19.8415	113.28	−174.25	23.8693
CSR	230	1,071.083	16,717.2	0.3	2,192.402
AGE	230	1.5467	1.8573	0.4771	0.2604
SIZE	230	4.0690	5.9875	2.6333	0.9073
LEV	230	0.4258	6.8	−0.42062	0.76554

Table 4. Correlation Matrix.

Variables	ROA	ROCE	ROE	CSR	AGE	SIZE	LEV
ROA	1						
ROCE	0.8259*						
ROE	0.8293*	0.8847*	1				
CSR	0.2054*	0.3301*	0.3771*	1			
AGE	−0.0061	−0.0681	−0.0285	0.1776*	1		
SIZE	−0.1001	−0.2418*	−0.0722	0.6561	0.2331*	1	
LEV	−0.3470*	−0.3039*	−0.4110*	0.2699*	0.0842	0.1768*	1

Note: * denotes statistically significant at 1%.

capital utilization. ROE and ROA average 19.84% and 11.42%, respectively, with corresponding standard deviations of 23.87 and 12.55.

These corrected figures show moderate variation and reflect that Indian energy firms generally perform well financially, with positive returns on assets and equity. A mean ROA above 5% (Farhan et al., 2020) confirms efficient asset use in the sector. Among the control variables, firm size shows the highest mean value (4.07), measured as the natural logarithm of total assets, with relatively low variation ($SD = 0.91$). Firm age has a mean of 1.55 and a standard deviation of 0.26, reflecting slight differences in maturity among firms. Leverage (mean = 0.43, $SD = 0.77$) shows moderate dispersion, suggesting diverse capital structures.

Table 4 presents the correlation matrix to assess the preliminary relationships between variables. CSR spending shows a statistically significant and positive correlation with ROA, ROCE, and ROE, indicating a potential favorable effect of CSR investment on firm profitability. Control variables such as leverage and size exhibit negative correlations with performance indicators, while age shows a negligible correlation. Importantly, all correlation coefficients are below the 0.80 threshold, suggesting an absence of multicollinearity (Gujarati & Porter, 2009). However, regression diagnostics indicated the presence of heteroscedasticity and serial autocorrelation, which can bias the estimates and invalidate the OLS or REM/FEM model assumptions. To address these econometric issues and potential endogeneity between CSR spending and profitability (since profitable firms may spend more on CSR), the two-step System GMM was adopted. GMM is

Table 5. Hausman Test.

Model	χ^2 Statistic	χ^2 DF	*p*
Model I-ROA	2.5250	4	.6402
Model II-ROCE	3.4135	4	.4911
Model III-ROE	4.1832	4	.3818

particularly suited for dynamic panel data with endogenous regressors, heteroscedasticity, and autocorrelation (Arellano & Bover, 1995; Blundell & Bond, 1998). This model enables robust and consistent parameter estimation, making it the most appropriate technique in this context. The significant positive association between CSR spending and financial metrics implies that strategic CSR initiatives can enhance firm performance in the Indian energy sector.

Regression Results

Results of the Hausman Test

The Hausman test was conducted to decide whether to use the REM or the FEM. The results are presented in Table 5. The *p* values for each model exceeded the 5% significance level, leading to a failure to reject the null hypothesis, which supports the consistency of the REM. Therefore, the REM was deemed appropriate and reliable for all the models assessed, namely Model I (ROA), Model II (ROCE), and Model III (ROE).

Results of REM

Table 6 summarizes the results of the REM for each model, incorporating lagged CSR expenditure ($CSR_{i(t-1)}$) as the main explanatory variable. The analysis reveals a significant negative relationship between CSR spending in the previous year and the financial performance of Indian energy sector firms, as measured by ROA, ROCE, and ROE. This finding suggests that CSR investments may initially impose financial burdens such as capital outlays and compliance costs that outweigh short-term gains. While companies often engage in CSR activities to meet environmental standards and support their workforce and communities, these benefits may not materialize immediately in financial terms. Similar delayed-effect observations are reported by Cui et al. (2015), Feng et al. (2018), and Nguyen et al. (2022), who note that in developing economies, immediate returns from CSR are limited due to consumer price sensitivity. Conversely, Maqbool and Zameer (2018) and Bag and Omrane (2022) document positive effects when CSR initiatives are strategically aligned and well-managed. Beldad et al. (2020) caution that misaligned or poorly executed CSR programs can hinder potential benefits altogether.

For control variables, leverage shows a significant and adverse effect on all performance measures, consistent with higher debt-related financial risks. Firm size exerts a positive influence across models but is statistically significant only for ROE at the 1% level, indicating possible scale-related advantages for equity returns. Firm

Table 6. Empirical Results of Random Effect Model (REM).

	Model I-ROA		Model II-ROCE		Model III-ROE	
Variables	Coefficient	*p* Value	Coefficient	*p* Value	Coefficient	*p* Value
$CSR_{i(t-1)}$	–0.0005***	.094	–0.0032*	.0000	–0.0078*	.0000
AGE	6.8687	.2245	6.9244	.4896	–6.5431	.5572
SIZE	1.6614	.4150	3.7221	.2766	10.6562*	.0048
LEV	–3.3267*	.0000	–3.7112**	.0178	–7.5420*	.0001
C	–3.9552	.6595	1.6903	.9189	–1.6187	.9311
R^2	0.1883		0.2128		0.4793	
Homoscedasticity (Breusch–Pagan test)	446.103 (0.000)		441.747 (0.000)		427.163 (0.000)	
Autocorrelation (Durbin–Watson test)	1.14706		1.014315		1.060847	

Note: *, ** and *** denotes statistically significant at 1%, 5%, and 10%, respectively.

age positively affects ROA and ROCE but negatively affects ROE, implying that operational experience may boost asset and capital efficiency but not necessarily equity profitability. Among the models, the highest explanatory power is observed for ROE ($R^2 = 47.92\%$), followed by ROCE (21.28%) and ROA (18.83%).

To ensure robustness, diagnostic tests were conducted. The Breusch–Pagan test confirmed the presence of heteroscedasticity ($p < .05$), while the Durbin–Watson test indicated serial correlation (statistic < 2, $p < .05$). These violations of classical assumptions justify the use of the two-step System GMM as a robustness check in subsequent analysis.

Results of GMM

Table 7 presents the outcomes of the two-step System GMM for each model, incorporating CSR expenditure with a one-year lag ($CSR_{i(t-1)}$) to address simultaneity and capture delayed effects. The coefficients of the lagged dependent variables are statistically significant at the 1% level across all models, confirming the appropriateness of a dynamic specification. The results show that lagged CSR is negatively and significantly associated with ROA, ROCE, and ROE, indicating that CSR spending in the preceding year adversely affects current financial performance. This suggests that the short-term financial returns from CSR activities are limited, as initial costs may outweigh immediate benefits.

Regarding the control variables, firm age has a consistent, positive, and significant impact on performance across all models, implying that more established firms are better positioned to leverage operational experience. In contrast, firm size exhibits a significant negative effect, possibly reflecting diseconomies of scale or inefficiencies in larger energy firms. Leverage exerts a negative influence on ROA but a positive and significant effect on ROCE and ROE, suggesting that debt financing can improve returns on capital and equity but may reduce overall asset efficiency. The Arellano–Bond tests indicate that AR(1)

Table 7. Empirical Results of Generalized Method of Moments (GMM).

	Model I-ROA		Model II-ROCE		Model III-ROE	
Variables	Coefficient	*p* Value	Coefficient	*p* Value	Coefficient	*p* Value
Lagged variable $CSR_{i(t-1)}$	0.3588*	.0000	0.3095*	.0000	0.2392*	.0000
	–0.0022*	.0000	–0.0083*	.0000	–0.0152*	.0000
AGE	42.0106*	.0000	107.0814*	.0000	101.0919*	.0091
SIZE	–15.2183*	.0000	–43.8864*	.0000	–46.4138*	.0034
LEV	–0.4620***	.0952	2.8115*	.0002	4.3818*	.0007
AR(1) test *p* value	–3.898*	.000	–3.359**	.001	–0.563	.573
AR(2) test *p* value	–2.071**	.038	–2.045**	.041	–0.827	.408

Notes: *, ** and *** denotes statistically significant at 1%, 5%, and 10%, respectively.
Lagged variable denotes the ROA (–1), ROCE (–1), and ROE (–1), respectively, for each model.

is significant in Models I and II, as expected in first-differenced GMM, while AR(2) *p* values are insignificant across all models, confirming the absence of problematic second-order serial correlation and supporting the validity of the model specification (Roodman, 2009).

Conclusion and Policy Recommendations

This study examined the impact of CSR expenditure on the financial performance of Indian energy distribution companies, using panel data from 23 firms over the period 2014–2015 to 2023–2024. The analysis employed both the REM and a two-step System GMM to address endogeneity and ensure robustness. Given the mandatory nature of CSR under the Companies Act, 2013, this research provides empirical insights into a policy-driven CSR landscape.

The findings suggest that CSR expenditure had a significant and negative impact on all three performance measures, ROA, ROCE and ROE, particularly under the GMM model, even when incorporating a one-year lag. This indicates that, in the short to medium term, CSR activities may impose costs that outweigh immediate financial benefits. Among the control variables, firm size and leverage consistently showed significant influence on financial performance across all models, while firm age demonstrated strong significance only in the GMM framework, implying that operational maturity may influence performance outcomes over time.

These results underscore the importance of viewing CSR as a long-term strategic investment rather than expecting immediate financial gains. In a regulated sector like energy distribution, where firms operate under tight margins and public scrutiny, CSR can still serve as a reputational and operational tool if planned effectively. However, the efficiency, targeting, and execution of CSR initiatives are critical for ensuring eventual value creation. Contrary to the assumption that CSR inherently yields positive returns, this study demonstrates that without strategic alignment, CSR compliance may initially burden firm performance before longer-term benefits emerge.

Policymakers should recognize that CSR's financial returns may be delayed and contingent upon sector-specific realities. Regulatory frameworks could be refined to allow flexibility in project selection, multi-year planning, and performance-linked CSR reporting. Reducing regulatory overlaps and aligning CSR with national development priorities such as renewable energy expansion and rural electrification could enhance both societal impact and eventual firm performance.

For corporate managers, the findings suggest that larger and well-leveraged firms may still be positioned to integrate CSR into long-term strategic goals, but careful cost-benefit planning and stakeholder engagement are essential. The study also highlights the importance of lagged evaluation models, showing that CSR's financial impact often unfolds over time rather than immediately. This has implications for internal performance monitoring, CSR budgeting, and strategic resource allocation. Overall, this study contributes to the literature by demonstrating that mandated CSR in high-impact, regulated sectors requires careful design to avoid short-term financial strain while enabling longer-term performance gains. Future research may further explore how project type, governance quality, and operational efficiency moderate the CSR-performance relationship in distribution utilities.

However, this study has certain limitations. It analyzes CSR activities using overall spending data. Decomposing CSR activities into environmental, economic, and social components may yield more precise results. Additionally, the study is limited to the energy sector and relies solely on accounting-based performance measures. In future, research could expand the sample size to incorporate firms from other sectors and incorporate market-based and growth measures alongside accounting-based performance measures. Comparative studies across different sectors and countries could also provide valuable insights.

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