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A Statistical Analysis of Corporate Social Responsibility Expenditure and Social Development in India

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Abstract

Corporate Social Responsibility (CSR) became a mandatory corporate responsibility in India following the Companies Act, 2013. This study examines the relationship between CSR expenditure and selected dimensions of social development in India. The analysis uses corporate disclosures, Ministry of Corporate Affairs (MCA) CSR data, annual reports, Census, National Family Health Survey, National Sample Survey Office and IndiaStats sources. The study covers 2014–2021 for descriptive and sectoral analysis and draws on a broader unbalanced panel of 1,787 firm-year observations covering 308 firms across 21 states for the empirical assessment. The findings indicate that CSR expenditure is positively associated with several education, health, infrastructure and poverty-related indicators. A ₹1 million increase in voluntary CSR expenditure during 2015–2019 is associated with a 0.71% increase in literacy, a 0.787% increase in the proportion of fully immunized children, a 0.18% reduction in under-five mortality, and a 0.048% reduction in the population living in slums. During 2017–2019, the corresponding estimates include a 0.584% reduction in the poverty gap and a 0.482% reduction in the poverty gap at national poverty lines. These relationships should be interpreted as empirical associations unless supported by the identification strategies described in the source study. The results highlight the importance of targeted CSR allocation and stronger coordination between corporate initiatives and public development programmes.

Keywords: Corporate Social Responsibility (CSR), CSR Expenditure, Social Development, Education, Health, Infrastructure, Poverty, Inequality, India

Introduction

Corporate Social Responsibility has evolved from largely philanthropic activity into an institutionalised component of corporate governance and social development in India. The Companies Act, 2013 established a statutory CSR framework for qualifying companies and prescribed CSR activities under Schedule VII. Eligible companies are required to spend at least 2% of their average net profits over the preceding three financial years on approved CSR activities. The framework places emphasis on areas including education, poverty alleviation, gender equality, health care and infrastructure. The introduction of mandatory CSR raises an important empirical question: whether corporate social expenditure produces measurable improvements in social development. Although government expenditure remains the major source of public welfare provision, CSR can supplement public resources in areas where social needs remain substantial. This study therefore evaluates the statistical relationship between CSR expenditure and selected indicators of education, health, infrastructure, poverty and inequality.

Research Objectives

1. To examine the trend and sectoral distribution of CSR expenditure in India.
2. To statistically assess the relationship between CSR expenditure and education outcomes.
3. To examine the association between CSR expenditure and health indicators.
4. To evaluate relationships between CSR expenditure, infrastructure, poverty and inequality.
5. To assess regional differences in the social-development effects of CSR expenditure.
6. To identify implications for companies, regulators and development stakeholders.

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Research Questions

1. How has CSR expenditure changed since the introduction of mandatory CSR?
2. Which social-development indicators are most strongly associated with CSR expenditure?
3. Does higher CSR expenditure correspond with improvements in education and health?
4. Is CSR associated with reductions in poverty and inequality?
5. Do the observed relationships vary across regions and states?

Theoretical Framework

The study adopts a stakeholder-oriented view of CSR in which corporations are expected to consider social outcomes alongside financial performance. Mandatory CSR creates an institutional mechanism through which qualifying firms contribute resources to activities with public and community benefits. Education and health are treated as foundational development investments because improvements in human capabilities can support longer-term productivity and welfare. Infrastructure, poverty reduction and inequality are treated as broader indicators through which social investment may

translate into improved living conditions. The analytical framework assumes that CSR expenditure may affect social outcomes directly through corporate-funded programmes and indirectly through improvements in human capital, access to services and local economic opportunities. At the same time, social development may influence the geographic and sectoral allocation of CSR. The study therefore considers potential reverse causality and uses panel, fixed-effects, difference-in-differences and causality-oriented specifications described in the source material.

Data and Methodology

The study combines firm-level CSR information with state- and district-level social-development indicators. CSR information is obtained from corporate disclosures, the Ministry of Corporate Affairs CSR portal and annual reports. Social-development measures are drawn from the National Family Health Survey, National Sample Survey Office, Census and IndiaStats. The descriptive CSR period covers 2014–15 to 2020–21, while the broader empirical panel contains 1,787 firm-year observations for 308 firms across 21 states and spans 2010–2020.

1. Variables

Variable	Operational measure	Role
CSR intensity	Percentage of profits spent on CSR	Main explanatory variable
Per-capita CSR expenditure	CSR expenditure relative to population	Alternative CSR measure
CSR sector share	Sector's share of total CSR spending	Sectoral analysis
Education	Literacy and related education indicators	Outcome
Health	Immunisation, mortality and health-access indicators	Outcome
Infrastructure	Infrastructure and sanitation indicators	Outcome
Poverty	Poverty gap and related measures	Outcome
Inequality	Income/consumption distribution indicators	Outcome
Regional characteristics	State/district characteristics and controls	Controls

2. Econometric Strategy

The empirical strategy combines unbalanced panel models and cross-sectional specifications. State and district fixed effects are used to account for unobserved characteristics that are stable within the relevant geographical unit. Control variables include educational attainment, public expenditure, access to finance and other regional characteristics. The source study also reports the use of regression, fixed-effects, instrumental-variable and treatment-effect approaches. Difference-in-differences and Granger-causality approaches are used to investigate the direction of association and potential endogeneity.

A general baseline specification can be represented as: $\text{Social Development}_{it} = \alpha + \beta \text{CSR}_{it} + \gamma X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$, where CSR_{it} denotes CSR expenditure or intensity, X_{it} represents control variables, μ_i

captures geographical fixed effects, λ_t captures time effects, and ε_{it} is the error term. The coefficient β represents the estimated association between CSR expenditure and the selected social-development indicator.

Descriptive Statistical Analysis

1. CSR Expenditure Trend

CSR expenditure increased over the period examined, although the annual pattern showed cyclical variation. Reported CSR expenditure by 517 listed corporations for 2014–15 to 2020–21 provides a substantial empirical basis for examining the post-regulation period. Real CSR spending reached a reported peak of ₹24.88 billion in 2019–20. Sectoral expenditure varied considerably, indicating that industry characteristics and strategic priorities influence CSR allocation.

Indicator	Reported statistical value
Listed corporations covered	517
Descriptive CSR period	2014–15 to 2020–21
Peak real CSR spending	₹24.88 billion (2019–20)
Broader empirical observations	1,787 firm-year observations
Unique firms in broader panel	308
States in broader panel	21
Broader panel period	2010–2020

2. Quantitative Relationship Between CSR and Social Development

The source study reports several estimated relationships between a ₹1 million increase in

voluntary CSR expenditure and social-development indicators. These estimates are reproduced below as statistical findings from the underlying study.

Indicator	Period	Estimated association for ₹1 million increase in CSR
Pupil–teacher ratio	2015–2019	0.056% decrease
Literacy rate	2015–2019	0.71% increase
Number of polytechnic colleges	2015–2019	1.61% increase
Apex learning outcomes	2015–2019	0.072% improvement
Children fully immunized	2015–2019	0.787% increase
Under-five mortality ratio	2015–2019	0.18% decrease
Population living in slums	2015–2019	0.048% decrease
Poverty gap	2017–2019	0.584% decrease
Poverty gap at national poverty lines	2017–2019	0.482% decrease
Richest-to-poorest income-share ratio	2017–2019	0.85% decrease
Highest-to-lowest regional consumption ratio	2017–2019	1.805% increase

Interpretation: The reported coefficients indicate that higher CSR expenditure is associated with improvement in several education and health measures and with reductions in selected poverty indicators. The increase in the highest-to-lowest regional consumption ratio, however, indicates that not every distributional indicator moves in the same direction. Consequently, CSR should not be interpreted as producing uniformly positive outcomes across all dimensions of development.

Education Outcomes

Education is a major CSR priority under the statutory framework. The reported empirical estimates indicate a 0.71% increase in literacy associated with a ₹1 million increase in voluntary CSR expenditure during 2015–2019. The same increase is associated with a 0.056% decrease in the pupil–teacher ratio, a 1.61% increase in the number of polytechnic colleges and a 0.072% improvement in apex learning outcomes. These estimates suggest that CSR interventions in education may contribute to both access and quality-related outcomes.

6. Health Outcomes

Health-related CSR expenditure is associated with measurable changes in selected health indicators. During 2015–2019, a ₹1 million increase in voluntary CSR expenditure is associated with a 0.787% increase in children fully immunized and a 0.18% reduction in the under-five mortality ratio. These findings support the role of CSR in complementing public health interventions, particularly where corporate programmes improve access to preventive and community health services.

Infrastructure, Poverty and Inequality

The statistical evidence also covers infrastructure, living conditions and distributional outcomes. CSR expenditure is associated with a 0.048% reduction in the proportion of the population living in slums during 2015–2019. For 2017–2019, a ₹1 million increase in CSR expenditure is associated with a 0.584% reduction in the poverty gap and a 0.482% reduction in the poverty gap measured at national poverty lines.

The inequality estimates are mixed. The richest-quintile share relative to the poorest-quintile share is reported to decline by 0.85%, while the ratio of the highest to lowest regional consumption expenditure increases by 1.805%. This contrast suggests that improvements in one dimension of inequality do not necessarily imply convergence across all regional consumption measures.

Regional and Sectoral Analysis

CSR allocation is uneven across sectors and regions. The study covers infrastructure, financial services, consumer goods, metals and mining, and finds substantial sectoral variation in expenditure. Such differences are important because CSR projects are not distributed randomly: firms may concentrate resources where they have operations, where community needs are visible, or where projects align with corporate capabilities. Regional heterogeneity is also reported in the broader empirical analysis. Social-development gains are greater in less affluent states, suggesting that CSR may have a stronger marginal contribution where baseline public and household resources are more constrained. Nevertheless, uneven CSR allocation means that some states and districts

can receive substantially greater corporate support than others.

Statistical Robustness and Causality

Several robustness checks are described in the source material. Alternative specifications include logarithmic CSR expenditure, additional controls and exclusion of Andhra Pradesh, Maharashtra and Tamil Nadu to test whether results are disproportionately driven by large or highly urbanised states. The broader study also employs difference-in-differences, Granger-causality tests and alternative estimators to address potential endogeneity. The reported results indicate a statistically significant relationship between CSR outlays and several social variables, while the causality-oriented tests reported in the source indicate evidence against a reverse causal effect. However, individual coefficients, standard errors, confidence intervals and exact significance levels are not provided in the supplied document. Therefore, this rewritten paper does not invent those statistics.

Discussion

Overall, the statistical evidence suggests that mandatory CSR in India has contributed to selected dimensions of social development. Education and health appear particularly responsive to CSR expenditure, consistent with the statutory priority given to these areas. Poverty-related indicators also show favourable associations. However, the mixed inequality evidence demonstrates that the benefits of CSR are not automatically distributed evenly. The effectiveness of CSR depends not only on the amount spent but also on project selection, geographical targeting, implementation quality, continuity and coordination with public programmes. CSR should therefore be understood as a complementary development mechanism rather than a substitute for government expenditure.

Policy Implications

1. CSR expenditure should be aligned with measurable local development gaps using district- and state-level indicators.
2. Companies should prioritise multi-year education and health programmes where measurable outcomes can be monitored.
3. CSR reporting should emphasise outcomes and impact indicators in addition to expenditure amounts.
4. Government and corporate agencies should improve coordination to avoid duplication and improve geographic coverage.
5. Less affluent and underserved regions should receive greater attention where CSR can generate higher marginal social benefits.
6. Independent impact evaluation should be incorporated into large CSR projects.
7. Corporate boards should assess both financial compliance and measurable social outcomes when reviewing CSR portfolios.

Limitations

The analysis is constrained by data availability, measurement differences across datasets and the

difficulty of capturing all forms of CSR expenditure. Publicly reported CSR expenditure may not capture every social activity undertaken by firms. Some social outcomes also depend on government policy, economic conditions and regional characteristics that cannot be completely controlled for. Although the source study uses several identification and robustness strategies, the statistical relationships should be interpreted in the context of the underlying research design.

Directions for Future Research

1. Develop longer state- and district-level panels to examine delayed CSR effects.
2. Compare mandatory CSR with pre-2014 voluntary CSR activities.
3. Examine the effectiveness of CSR by individual Schedule VII activity.
4. Use project-level impact evaluations to identify mechanisms.
5. Study differences between public-sector and private-sector CSR.
6. Examine gender, rural development, environmental sustainability and digital inclusion outcomes.
7. Combine quantitative panel analysis with qualitative field evidence.

Conclusion

This study provides a statistical assessment of the relationship between CSR expenditure and social development in India. The evidence indicates that CSR expenditure is associated with improvements in literacy, educational infrastructure, learning outcomes, immunisation and selected health indicators, together with reductions in under-five mortality, slum population and poverty gaps. The broader panel evidence covering 1,787 firm-year observations, 308 firms and 21 states further indicates a positive relationship between CSR engagement and several dimensions of social development. Regional differences remain important, and inequality outcomes are not uniformly positive. The central implication is that the success of CSR should be judged not simply by compliance with the 2% expenditure requirement, but by the measurable social outcomes generated by that expenditure. Better targeting, transparent reporting, rigorous evaluation and stronger coordination between corporate and public development institutions can increase the contribution of CSR to inclusive development in India.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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