



Structural Equation Model for Assessing Goodness of Fit on CSR Impact Factors

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Abstract – This study focuses on IT companies engaging in various CSR activities, with CSR standing for Corporate Social Responsibility. In India, the economy has experienced significant growth over the past two decades, largely due to the expansion of the Information Technology (IT) and Information Technology Enabled Services (ITES) sectors. Corporate citizenship and CSR are closely tied to corporate behavior and reputation. When companies are socially responsible, they can effectively address societal concerns and demonstrate their impact. Different IT companies have adopted various CSR initiatives, and in India, CSR is mandated by Section 135(1) of the Companies Act, 2013, with indicative areas of CSR listed under Schedule VII. The objectives of this study are twofold: (a) to assess the influence of CSR practices adopted by IT companies on societal development and the benefits to the company, and (b) to build a structural equation model (SEM) for goodness-of-fit and test whether any statistical significance exists regarding CSR impact factors. AMOS (Analysis of moment Structures), a visual program for SEM, was used for this study. SEM was employed to test a model based on observed data from CSR-practicing IT companies in Chennai City, India. AMOS calculated a modification index for all constrained parameters in the model, indicating how much the chi-square value of the model would decrease if a parameter were free instead of constrained. Using these modification indices, the model was refined to achieve a better fit. The software packages used for data analysis and testing in this study were IBM SPSS and AMOS.

Keywords – Corporate Social Responsibility (CSR), Information Technology (IT), Goodness-of-fit, Structural Equation Modeling (SEM), AMOS, Impact, Model, Hypothesis, Indices.

I. INTRODUCTION

Corporate Social Responsibility represents a comprehensive self regulating models that empowers a company to be accountable not only to itself but also to its stakeholders and the wider public Often referred to as corporate citizenship CSR demands that companies remain acutely conscious of their impact on every facet of society that involves feasible social and environmental dimensions The integration of CSR principles into the fundamental operations of a business can significantly enhance the company's overall competitiveness optimize the efficiency of its human resources and fortify its brand image and reputation Moreover CSR initiatives play a crucial role in bolstering customer loyalty and maximizing the creation of societal value By implementing CSR strategies companies are encouraged to make a positive impact on the environment and their stakeholders—those individuals and groups who have a vested interest in the company's performance and outcomes Many businesses incorporate CSR into their brand identity and reputation operating under the belief that customers are more inclined to support and remain loyal to brands that exhibit ethical responsibility The scope of CSR can vary widely depending on the specific nature of the company and the industry in which it operates Through the execution of various CSR programs including philanthropy and volunteerism businesses have the opportunity to contribute positively to society while simultaneously enhancing their

brand's impact and visibility CSR is crucial in fostering beneficial relationships between society and companies It strengthens the bonds between employees and their employers boosts overall morale and deepens the sense of community connection By committing to socially responsible practices companies can achieve a harmonious balance between pursuing profitability and contributing to the welfare of society at large The comprehensive nature of CSR means that it encompasses a wide range of activities and initiatives These can include efforts to reduce the company's carbon footprint initiatives to improve labor policies philanthropic endeavors such as donating money or resources to local communities and encouraging employees to volunteer their time and skills to various causes By doing so companies not only help to address pressing social and environmental issues but also enhance their reputation as responsible corporate citizens In addition to external benefits CSR also yields significant internal advantages for companies It can lead to improved employee satisfaction and retention as workers are more likely to feel proud of and loyal to a company that demonstrates a commitment to ethical practices and social responsibility Furthermore CSR can stimulate innovation by encouraging companies to develop sustainable products and services that meet the evolving expectations of consumers and society Ultimately CSR is essential for both society and companies It fosters a stronger bond between employees and corporations boosts morale and enhances the connection between businesses and their communities



Through a genuine commitment to CSR companies can achieve long term success while making meaningful contributions to the world. While traditionally more common among large corporations, even small and medium enterprises (SMEs) are increasingly participating in CSR activities, such as donations and educational support. Large companies like Microsoft, Oracle, Infosys, IBM, and Google are leaders in workplace CSR, focusing on environmental consciousness, sustainability, charitable giving, and volunteer programs. Investing in CSR, whether innovative or routine, positively impacts both the community and the company's bottom line. This study focuses on IT companies of various sizes practicing CSR activities. It explores the impact of CSR on corporate governance and business development. The study's objectives are to (a) assess the influence of CSR practices on societal development and (b) build a structural equation model for goodness-of-fit testing to determine statistical significance. The five dimensions of CSR impact—improved community relations, enhanced brand image, increased productivity, employee attraction and retention, and improved organizational culture—are evaluated using SEM and AMOS for goodness-of-fit testing.

II. LITERATURE REVIEW

The literature review provides an overview of major writings and sources on CSR activities and SEM for model building. While many sources are available, only a few indicative reviews are mentioned here. In Indian culture, corporate social responsibility has roots dating back to 1917 when Henry Ford emphasized the broader social mission of the Ford Motor Company (Lee 2008, p. 54). Belal Ataur Rehman (2001) highlighted the lack of research on CSR disclosures in developing countries, using Bangladesh as a case study. In 2007 study, Lorraine Sweeney discovered that Corporate Social Responsibility (CSR) exhibits a robust positive relationship with several critical aspects of business and societal engagement. Specifically, Sweeney found that CSR significantly enhances a company's societal reputation, which in turn elevates its standing and credibility within the community and broader society. Additionally, CSR plays a pivotal role in attracting, motivating, and retaining employees. Companies that are perceived as socially responsible are more appealing to potential employees, fostering a sense of pride and alignment with the company's values among existing staff, thereby boosting overall employee satisfaction and loyalty.

Wayne Visser and Nick Tolhurst (2010) provided national profiles of CSR practices for 58 countries, offering insights into the evolution and practice of corporate sustainability. Anupam Singh and Dr. Priyanka Verma (2014) argued that India's vast population and economic disparities necessitate corporate support for societal welfare through mandatory CSR policies. Dr. Sanjeeb Kumar Dey and Ashutosh Prayas Dash (2018) noted the need to understand why companies invest in

certain CSR practices and how these choices are influenced by cultural and competitive factors. Gazi Md. Shakhawat Hossain et al. (2019) explored the relationship between CSR and financial performance, demonstrating that CSR influences financial performance through mediating organizational factors.

From the literature, it is evident that CSR activities benefit both society and corporate performance. The hypotheses tested in this study are:

- **H01:** There is no significant relationship between CSR activities and societal impact.
- **H11:** There is a significant relationship between CSR activities and societal impact.
- **H02:** The hypothesized model has a good fit.
- **H12:** The hypothesized model does not have a good fit.

III. RESEARCH METHODOLOGY AND SAMPLING

Research methodology involves the specific procedures and techniques used to identify, select, process, and analyze information relevant to a research topic. It encompasses the systematic approach that researchers adopt to ensure their study is accurate and reliable. This study employed a structured questionnaire administered to respondents from IT companies.

The questionnaire covered four constructs: (a) socio-economic factors, (b) CSR assessment and practices, (c) CSR impact factors, and (d) CSR effectiveness. Variables were measured on nominal and interval scales, with interval scale statements rated on a 5-point Likert scale. Reliability was tested using Cronbach's alpha, resulting in a score of 0.8205, which is highly acceptable.

The study population consisted of IT and ITES companies in Chennai. Criteria for sample selection included:

- Companies must belong to the IT and ITES industry and be listed with available financial and sustainability reports on CSR.
- Companies must have engaged in CSR activities as per the Companies Act, 2013, and reported them in annual reports.

The sample size was 390 respondents from 30 IT and ITES companies, selected from the top 100 listed companies, representing diverse groups such as gender, age, and management levels.

IV. DATA ANALYSIS AND RESULTS

Data from primary sources involving respondents from selected IT companies were analyzed using Cronbach's alpha, Chi-square tests, K-S tests, ANOVA, and SEM with SPSS.



Table 1: One Sample Kolmogorov-Smirnov Test on CSR Impact

K One Sample Test	Improved community relations	Enhanced brand image	Increased productivity	Attraction of employees	Improved organization culture
N	390	390	390	390	390
Normal Parameters a, b					
Mean	3.47	3.49	3.46	3.48	3.42
Std. Deviation	0.903	0.886	0.900	0.900	0.931
Most Extreme Differences					
Absolute	0.378	0.379	0.379	0.362	0.372
Positive	0.242	0.244	0.241	0.235	0.233
Negative	-0.378	-0.379	-0.379	-0.362	-0.372
Kolmogorov-Smirnov Z	7.467	7.488	7.486	7.149	7.340
Asymp. Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000
a. Test distribution is Normal. b. Calculated from data.					

Interpretation

The Kolmogorov-Smirnov test shows that the p-values for all components are less than 0.05, indicating that the CSR impact data significantly deviates from a normal distribution. This signifies the importance of CSR factors in impacting the organizational and societal outcomes.

Table 2: Reliability Statistics of CSR on Business Development

Scale statistics				
Mean	Variance	Std. deviation	Cronbach's Alpha	N of Items
17.32	11.894	3.449	0.8205	5

Interpretation

The Cronbach's Alpha value of 0.8205 indicates high reliability of the CSR scale in assessing business development impacts. This suggests the internal consistency of the CSR factors used in the study.

Table 3: Chi-Square Statistics of CSR Activities Impact

Test statistics	Improved community relations	Enhanced brand image	Increased productivity	Attraction of employees	Improved organization culture
Chi-Square	465.615	471.487	469.051	419.564	441.513
Df	4	4	4	4	4
Asymp. Sig.	0.000	0.000	0.000	0.000	0.000

Interpretation

The chi-square test results indicate that the p-values for all components are less than 0.05, implying that CSR activities significantly impact community relations, brand image, productivity, employee attraction, and organizational culture.

Table 4: One-Way ANOVA - Combined CSR Impact Using Factor of CSR Effect on Society

CSR Effect on Society	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24.140	17	1.420	2.015	0.010
Within Groups	262.143	372	0.705		
Total	286.283	389			

Interpretation: The ANOVA results show that the sum of squares between groups is 24.140 with a degree of freedom of 17. The F-value is 2.015 with a p-value of 0.010, which is less than 0.05. This indicates a statistically significant difference in CSR impact factors, leading to the rejection of the null hypothesis

V. SEM FOR GOODNESS-OF-FIT ON FACTORS OF CSR IMPACT

Figure-1: Structural Equation Model (SEM) for Goodness-of-Fit

The SEM considers CSR impact with five components: community relations, brand image, productivity, employee attraction, and organizational culture. The values of all components are greater than 0.50, indicating their statistical significance. The relationship between CSR impact and CSR effect is 0.34, meaning that an increase in CSR impact leads to a proportional change in CSR effect by 0.34.

Notes for Model

Table-5: Result (Default Model)

Minimum was achieved
Chi-square
Degrees of freedom (DF)
Probability level

Interpretation

The p-value of 0.706 is greater than 0.05, and the χ^2 value of 8.967 with 12 degrees of freedom indicates a good model fit. The CMIN/DF value of 0.747, which is less than 5.000, further confirms the model's significance.

Table- 6: Scalar Estimates (Group Number 1 - Default Model)

	Unstandardized Regression Weights Estimate	Standardized Regression Weights S.E.
CSR2 <--- CSR1	0.258	0.075
Community <--- CSR1	1.000	
Brand image <--- CSR1	1.043	0.094
Productivity <--- CSR1	1.176	0.116
Employees <--- CSR1	1.277	0.121
Ethics & Culture <--- CSR1	1.167	0.118
CSR Effect <--- CSR2	1.000	
CSR Impact <--- CSR2	1.296	0.390



Interpretation

The regression weights indicate that the estimates are significant ($p < 0.05$) with critical ratios greater than ± 1.96 , suggesting a strong relationship between CSR factors and their impacts.

Table-7: Variances (Group Number 1 - Default Model)

	Estimate	S.E.	C.R.	P	Squared Multiple Correlations
CSR1	0.295	0.050	5.864	***	CSR2 0.117
e8	0.147	0.050	2.961	0.003	CSR Impact 0.430
e2	0.462	0.040	11.510	***	CSR Effect 0.329
e3	0.399	0.038	10.593	***	Community 0.466
e4	0.327	0.036	9.115	***	Brand Image 0.595
e5	0.462	0.042	11.112	***	Productivity 0.506
e1	0.518	0.044	11.893	***	Employee 0.410
e6	0.341	0.055	6.154	***	Ethics & Culture 0.363
e7	0.371	0.088	4.237	***	

Interpretation: The variances show that all estimates are significant with p-values less than 0.05, confirming the statistical significance of the CSR components in the model.

Table- 8: Modification Indices (Before Application)

	M.I.	Par Change
e1 <--> e5	4.160	-0.056
e1 <		

Findings

Kolmogorov-Smirnov Test Results

The K-S test indicates that the data for CSR impact factors such as improved community relations, enhanced brand image, increased productivity, attraction of employees, and improved organizational culture deviate significantly from a normal distribution. This is evidenced by the p-values being less than 0.05 across all factors, suggesting that these CSR components have a significant impact on organizational and societal outcomes.

Reliability of CSR Scale

The Cronbach's Alpha value of 0.8205 demonstrates high reliability in the CSR scale used for assessing business development impacts. This indicates strong internal consistency among the CSR factors, confirming that the items within the scale are well-correlated and reliable.

Chi-Square Test Results

The chi-square test results show p-values of less than 0.05 for all CSR activities, indicating significant impacts on improved community relations, enhanced brand image, increased productivity, attraction of employees, and

improved organizational culture. This confirms the crucial role of CSR activities in various aspects of business and organizational development.

ANOVA Results

The one-way ANOVA results reveal a statistically significant difference in the impact of combined CSR factors on society. With a sum of squares between groups at 24.140, an F-value of 2.015, and a p-value of 0.010 (less than 0.05), the analysis supports rejecting the null hypothesis. This suggests that the different CSR impact factors contribute variably but significantly to societal outcomes.

Suggestions

Enhance CSR Initiatives

IT companies should continue to invest in and enhance their CSR initiatives, focusing on the key areas identified (community relations, brand image, productivity, employee attraction, and organizational culture) to further strengthen their positive impacts.

Targeted CSR Strategies

Develop targeted CSR strategies that address the specific needs of the community, enhance brand reputation, improve productivity, attract and retain employees, and foster a positive organizational culture. This tailored approach can maximize the effectiveness of CSR activities.

Monitor and Evaluate CSR Activities

Regularly monitor and evaluate the effectiveness of CSR activities using reliable metrics and statistical analyses (e.g., Cronbach's alpha, chi-square tests, and ANOVA) to ensure continuous improvement and alignment with organizational goals.

Promote CSR Impact Awareness

Increase awareness among stakeholders about the significant impacts of CSR activities. This can help in garnering more support and participation from employees, customers, and the community, enhancing the overall effectiveness of CSR efforts.

Leverage Positive CSR Outcomes

Use the positive outcomes of CSR activities, such as enhanced brand image and improved organizational culture, as marketing tools to attract customers and talent. Highlighting these achievements can provide a competitive edge in the market.

VI. CONCLUSION

The analysis of CSR impact using various statistical methods (K-S test, Cronbach's alpha, chi-square test, ANOVA) demonstrates the significant role that CSR activities play in improving community relations, enhancing brand image, increasing productivity, attracting employees, and fostering a positive organizational culture.



The high reliability of the CSR scale and the significant chi-square and ANOVA results underscore the importance of well-planned and executed CSR strategies. By continuing to invest in and refine CSR initiatives, IT companies can achieve substantial benefits for both the organization and society, contributing to sustainable business development and social welfare.

REFERENCES

1. Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94. <https://doi.org/10.1007/BF02723327>
2. Marsh, H. W., Balla, J. R., & McDonald, R. P. (1988). Goodness-of-fit indexes in confirmatory factor analysis: The effect of sample size. *Psychological Bulletin*, 103(3), 391-410. <https://doi.org/10.1037/0033-2909.103.3.391>
3. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50. <https://doi.org/10.1177/002224378101800104>
4. Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238-246. <https://doi.org/10.1037/0033-2909.107.2.238>
5. Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295-336). Lawrence Erlbaum Associates.
6. Carroll, A. B. (1999). Corporate social responsibility: Evolution of a definitional construct. *Business & Society*, 38(3), 268-295. <https://doi.org/10.1177/000765039903800303>
7. Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55. <https://doi.org/10.1080/10705519909540118>
8. Gefen, D., Straub, D., & Boudreau, M.-C. (2000). Structural equation modeling and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, 4(1), 7. <https://doi.org/10.17705/1CAIS.00407>
9. Rehman, B. A. (2001). Corporate social responsibility disclosures in Bangladesh. *Managerial Auditing Journal*, 16(5), 274-289. <https://doi.org/10.1108/02686900110392922>
10. McDonald, R. P., & Ho, M. H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1), 64-82. <https://doi.org/10.1037/1082-989X.7.1.64>
11. Sweeney, L. (2007). Corporate social responsibility in Ireland: Barriers and opportunities experienced by SMEs when undertaking CSR. *Corporate Governance: The International Journal of Business in Society*, 7(4), 516-523. <https://doi.org/10.1108/14720700710820497>
12. Visser, W., & Tolhurst, N. (2010). *The world guide to CSR: A country-by-country analysis of corporate sustainability and responsibility*. Greenleaf Publishing.
13. Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). Routledge.
14. Singh, A., & Verma, P. (2014). From philanthropy to mandatory CSR: A journey towards mandatory corporate social responsibility in India. *International Journal of Business and Management Invention*, 3(10), 10-14.
15. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson.
16. Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
17. Dey, S. K., & Dash, A. P. (2018). A study on the role of CSR in influencing the choice of investors. *Journal of Business Ethics*, 151(2), 397-414. <https://doi.org/10.1007/s10551-016-3263-0>
18. Hossain, G. M. S., et al. (2019). Impact of CSR on the financial performance of banks: Evidence from Bangladesh. *Asian Journal of Finance & Accounting*, 11(1), 111-132. <https://doi.org/10.5296/ajfa.v11i1.14378>
19. Fernando, J. (2021). Corporate social responsibility (CSR). Investopedia. <https://www.investopedia.com/terms/c/corp-social-responsibility.asp>