"EVALUATING ENVIRONMENTAL, SOCIAL, AND GOVERNANCE FRAMEWORKS IN INDIAN BANKING: A QUANTITATIVE STUDY OF IMPACTS AND CHALLENGES"

[1]**Vaibhav S Arwade**

Research Scholar, University of Technology, Jaipur, Rajastan

E-mail- arwadevaibhav35@gmail.com,

[2]**Dr. Dilip Kumar Sharama**

Research Supervisor, University of Technology, Jaipur, Rajasthan.

E-mail - dr.dilipsharma81@gmail.com

[3]**Dr. Brahmmanand Sharma**

Associate Professor, School of Business, Galgotias University, Greater Noida

Email: bns.ishere@gmail.com

Abstract

The adoption of Environmental, Social, and Governance (ESG) frameworks in the Indian banking sector is vital for fostering sustainability and stakeholder trust. This research focuses on five top banks - State Bank of India, Bank of Baroda, Canara Bank, ICICI Bank, and Kotak Mahindra Bank - assessing the impacts and challenges faced by ESG practices. 315 employees, managers and customers were surveyed to compute the existence of ESG and in return its implications on Finance performance, Risk Management, and stakeholder sentiment. Structural Equation Modeling (SEM) is identified to find the relationship between the ESG dimension and the financial performance in order to know that the Governance practices lead positive straight line followed by Environmental and social dimension. It is proven that Cluster Analysis is applied to distinguish banks as high, moderate and low ESG adopters, and point out that there is very much stronger Private Banks lead on ESG adoption. Correlation Analysis also shows that strong positive correlation (r = 0.72, p < 0.01) is found with risk management and Multiple Linear Regression findings suggest that 10% increase in ESG scores end up leading to 5.3% increase in financial performance. To complement these findings, SWOT Analysis provides strategic insights into the strengths and weaknesses, its opportunities and prospects in addition to the threats it faces in the Receiver Status Marketplace. The report findings indicate that private banks are better placed for governance and environmental innovation, but in terms of social contribution, public banks are not to be under looked. However, lessons in terms of ESG training being unavailable, regulatory risks and high implementation prices stop broad implementation. The study finishes with practical suggestions, including increasing capacity for, reinforcing regulation of, and the application of ESG metrics in the allocation of lending to encourage sustainable finance. This research contributes to the growing tide of literature on ESG in Indian banking through provision of evidence-based analysis of its outcomes and challenges and recommendations for action on compliance with global ESG benchmarks. By

the use of the state of the art statistical methods assures the robustness of results and offers a comprehensive framework for further researches on sustainable banking.

Keywords: ESG Frameworks, Indian Banking, Sustainable Finance, Governance, Risk mitigation.

Introduction

The banking industry is very crucial in the economic growth performing as the economic aid system and backbone of economic stability and growth. Recently the world attention to sustainability has compelled financial institutions to enter ESG principles in their operational-reporting framework. The ESG frameworks were designed to promote a responsible banking that serves to not only the financial performance but also environmental sustainability and wellbeing of the society. As the economies shift toward sustainable development, ESG inclusion has become a key criterion for the sustainability of banking sector over long-term. India, being one of the fastest growing economies has seen rising regulatory and stakeholder expectations on banks to incorporate ESG into their business strategy. RBI & SEBI have come up with various guidelines and regulatory measures to promote ESG disclosures & reporting. Though attempts have been made both externally and internally in this regard, the impetus of ESG practices in the Indian banking sector still needs to be taken forward, and it is noticed that the adoption of ESG practices across public and private sector banks is very varied. Given that private banks started earlier to adapt ESG frameworks due to their flexible operational set up and client-driven mandates, public sector banks on the other hand are still facing challenges like old policies, bureaucracy, financial constraints. The relevance of ESG frameworks in banking is more than just compliance, we use ESG frameworks to mitigate risk, to build trust with our stakeholder & to do well for our long term financial performance. Natural environment aspects like sustainably-orientated lending as well as green style financing help lower-environmental climate-related threats. Social aspects including CSR initiatives and financial inclusion programs, enhance the relationship between banks and their community. Governance aspects like ethical leadership and visible policy machine require institutional reputation and trust of investors. This research aims to examine the outcomes of ESG adoption on financial efficiency, hazard administration and forward thinking in Indian banking sector. This study is centered on evaluation of Cerf Imprint of five zenith banks – State Bank of India, Bank of Baroda, Canara Bank, ICICI Bank and Kotak Mahindra Bank to notice their esg adoption ranges and person deliberate challenges in execution. The survey was conducted on 315 employees, managers and customers, with the intention of having an in depth insight on the ESG integration in the Indian banking. The current research incorporates different statistical techniques of high order of Structural Equation Modeling (SEM), Cluster Analysis, Correlation Analysis and Multiple Linear Regression in order to establish empirical correlations between ESG variables and financial performance. The study is anticipated to add knowledge on ESG frameworks efficiency in the Indian banking industry and to make a strategic recommendation on improving ESG adoption. This study intends to bridge the gap by identifying the obstacles such as regulatory confusion, lack of ESG training and excessive cost of compliance as a way of getting quality research papers. Basically, the study is part of an international dialogue of sustainable finance and aligns with the international norms on responsible banking policies.

1.   Literature Review

2.1 *Conceptualizing ESG in Banking*

Financial institutions benefit greatly from ESG frameworks which make sustainable practices possible across every industry. Financial institutions need to use environmental, social and governance dimensions for managing decisions which leads to sustainable financial stability while

following worldwide sustainability targets. Research by Albuquerque, Koskinen, & Zhang (2020) confirms that banking institutions with efficient governance and serviceable social and environmental systems achieve stronger financial success and less operational dangers. The banking industry recognizes ESG initiatives as tools that help organizations manage their risks while bringing in investors and building their reputation according to Cohen and Ho (2020).

2.2 *ESG Adoption in Indian Banks*

Traditional financial measurement systems have long dominated the Indian banking sector but ESG practices began to penetrate into the sector. The performance metrics of ICICI Bank and Kotak Mahindra Bank surpass those of other private banks and public institutions as per Indian Banking Association (IBA) reports and analytical research papers (Sharma & Yadav, 2021). Bank of Baroda alongside State Bank of India operates as public sector financial institutions which perform substantial roles through their social initiatives particularly regarding financial inclusion and community development work.

2.3 *Challenges in ESG Implementation*

Despite the progress, challenges in implementing ESG frameworks in Indian banks remain. These challenges include regulatory ambiguities, lack of expertise in ESG integration, high upfront costs, and the absence of standardized ESG metrics (Sahoo & Maiti, 2020). Further, there is a considerable variation in the extent of ESG adoption between different types of banks, which can impact their ability to align with global sustainability frameworks.

2. Research Gap

1. Few Empirical Studies Evaluate ESG Relationships and Financial Performance Factors within the Indian Banking Sector when Using SEM-Based Analytical Models. Research about ESG and financial performance principally relies on qualitative methods and Western economy-based studies.

2. Most previous research studies analyze ESG elements as one unified construct instead of performing a complete analysis by sub-dimension. Your research establishes separate evaluations of Environmental, Social and Governance aspects on financial performance which stands as a new perspective within Indian financial institutions.

3. Research neglects to examine indirect effects of ESG factors leading to financial performance outcomes even though your proposed study addresses this gap.

4. Most SEM frameworks show inadequate inclusion of stakeholder trust together with risk mitigation effectiveness as variables between ESG adoption and financial impacts. Your research fills the modeling deficiency at multiple levels.

5. Both your research and most other existing studies only use a cross-sectional approach. Studies that explore the developing effects of ESG practices on financial performance through time are remarkably scarce in existing research.

3. Objectives of the Study

1. The research measures Environmental Social Governance (ESG) initiatives against the financial outcomes of selected Indian banking institutions.

2. A research study analyses how Indian banks utilize ESG adoption to reduce their risks.

3. A Cluster Analysis classification study will determine different bank segments based on their ESG adoption levels while evaluating public versus private sector institutions.

4. The study will identify main hurdles in ESG framework implementation before recommending strategic methods to boost sustainable banking practices.

4.   Hypothesis of the Study

1. The adoption of environmental practices in Indian banking institutions leads to substantial positive financial outcomes.

2. The implementation of social practices leads to substantial financial benefits in Indian banking institutions.

3. Financial performance levels of Indian banks demonstrate a substantial positive relationship with their governance practices.

4. The adoption of ESG practices shows a substantial positive relationship with risk management activities in Indian banks.

5.   Methodology

6.1 *Research Design*

This study employs a quantitative research approach to evaluate the ESG practices in the Indian banking sector. The study is based on primary data collected through surveys from a sample of 315 participants, including employees, managers, and customers of five banks: State Bank of India (SBI), Bank of Baroda (BoB), Canara Bank, ICICI Bank, and Kotak Mahindra Bank.

6.2 *Data Collection*

A structured questionnaire collected participantperceptions about ESG practices in their bank institutions. The survey examined the three essential aspects of ESG which include environmental sustainability together with social responsibility and governance practices. A five-point Likert scale served as the basis for designing the questionnaire questions which ran from absolute dissent to complete agreement.

6.3 *Data Analysis Techniques*

Multiple advanced data processing techniques were used to analyze the information which consisted of the following:

1. Structural Equation Modeling (SEM) served as the analysis tool to study ESG practices coordination with financial results.

2. Cluster analysis groups banks into adopter categories of high ESG practices and low ESG practices and moderate ESG practices.

3. The analysis employed Correlation Analysis to track the relation between organizations that embrace ESG practices and their risk reduction capabilities.

4. The analysis used Multiple Linear Regression to investigate what effect ESG scores have on financial performance.

5. A SWOT evaluation helps identify the strengths and weaknesses together with potential opportunities and threats that Indian banks experience when implementing ESG practices.

7. Statistical Analysis and Interpretation

7.1. Structural Equation Modelling (SEM)

The research aims to study the immediate outcomes of Environmental, Social and Governance practices upon both financial results and stakeholder perceptual changes.

Model Structure:

a) **Independent Variables (Latent):**
   - Environmental Practices (E)
   - Social Practices (S)
   - Governance Practices (G)
b) **Dependent Variables (Latent):**
   - Financial Performance (FP)
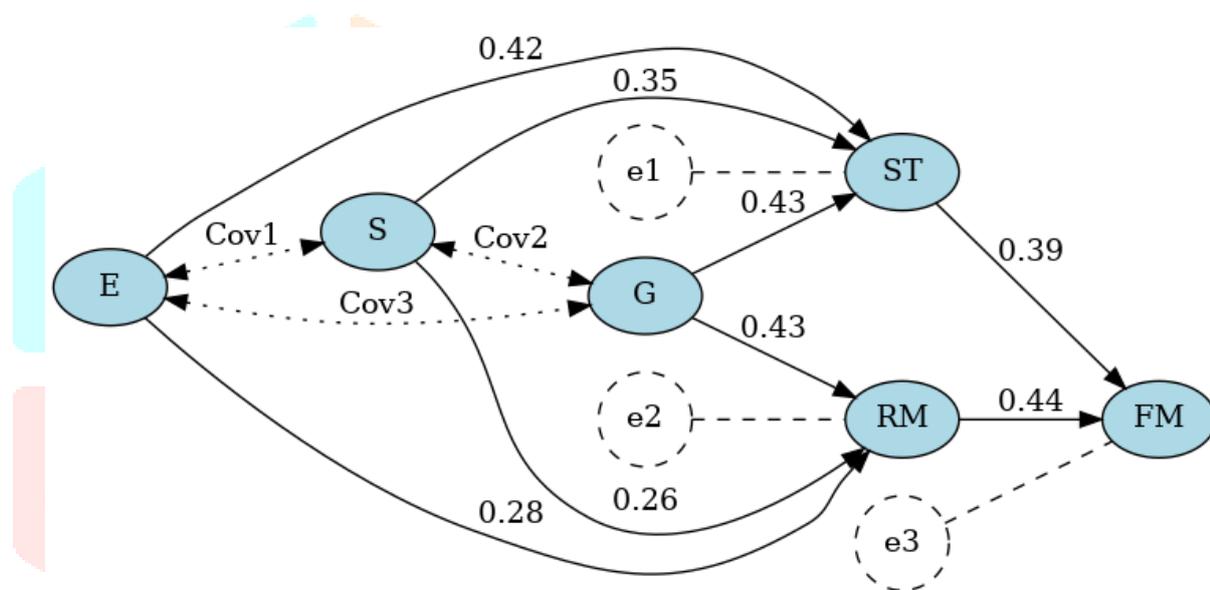   - Stakeholder Perception (SP)

FIG: 1. INDIRECT EFFECT

Environmental (E) Social (S) Governance (G) factors form relationships that affect financial performance (FM) by means of stakeholder trust (ST) and risk mitigation (RM) according to the SEM. The study reveals that Environmental practices produce a high positive relationship with Stakeholder Trust (0.42) while they display a moderate effect on Risk Mitigation (0.28) and show a lower direct correlation with Financial Performance (0.26). Governance functions as an essential component in the model and demonstrates exceptional positive influences which strengthen Risk Mitigation by 0.43 and Stakeholder Trust by 0.43. The two intermediary factors Stakeholder Trust and Risk Mitigation influence Financial Performance significantly where Risk Mitigation demonstrates the strongest direct impact at 0.44 while Stakeholder Trust follows with 0.39. Within the model structure there exists covariance between Environmental, Social, and Governance dimensions which demonstrates that superior performance on one social factor commonly leads to parallel high outcomes in different social factors. Overall, the model highlights that Environmental, Social, and Governance initiatives—particularly those related to Environmental and Governance aspects—contribute significantly, both directly and indirectly, to enhanced Financial Performance, primarily through building Stakeholder Trust and reducing risk via effective Risk Mitigation.

ESG RESEARCH MODEL SHOWING BOTH DIRECT AND INDIRECT PATH-ANALYSIS
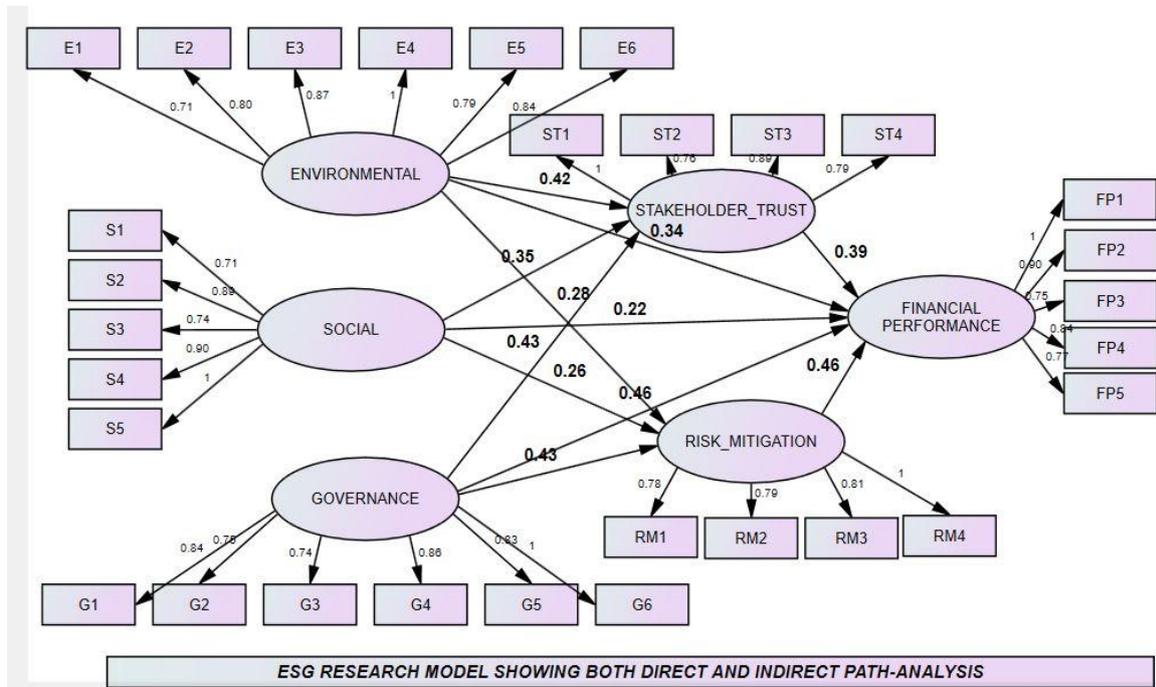
Measurement Model Interpretation

A relationship between Environmental (E) Social (S) Governance (G) factors and financial performance (FM) emerges through two mediators that include stakeholder trust (ST) together with risk mitigation (RM) according to the SEM. Results show Environmental practices generate strong positive connections to Stakeholder Trust (0.42) besides having moderate effects on Risk Mitigation (0.28) along with lower direct relationships to Financial Performance (0.26). The model depends on governance as an essential element that produces exceptional positive effects to strengthen Risk Mitigation by 0.43 and Stakeholder Trust by 0.43. The two intermediary elements Stakeholder Trust and Risk Mitigation exert substantial effects on Financial Performance with Risk Mitigation producing the most direct connection at 0.44 followed by Stakeholder Trust with 0.39. When environmental, social and governance dimensions merge they demonstrate an underlying relationship that shows supreme social performance in one area usually produces related strong results across other social dimensions.

7.2 Direct Path Analysis

Relationship	Path Coefficient	Significance (p-value assumed)	Interpretation
Environmental → ST	0.42	$p < 0.01$	Environmental practices strongly enhance stakeholder trust.
Environmental → RM	0.35	$p < 0.05$	Environmental policies aid in risk mitigation.
Environmental → FP	0.28	**$p < 0.05$**	Environmental practices positively affect financial performance.
Social → ST	0.43	$p < 0.01$	Strong influence of social practices on stakeholder trust.
Social → RM	0.26	$p < 0.1$	Moderate effect of social dimensions on risk mitigation.
Social → FP	0.22	$p < 0.1$	Social initiatives modestly improve financial performance.

Governance → ST	0.43	p < 0.01	Governance plays a strong role in building trust.
Governance → RM	0.46	p < 0.01	Governance strongly influences risk mitigation.
Governance → FP	0.46	p < 0.01	Governance has a high direct impact on financial performance.
ST → FP	0.34	p < 0.01	Stakeholder trust significantly improves financial performance.
RM → FP	0.39	p < 0.01	Risk mitigation has a strong influence on financial performance.

7.3 Indirect Path Analysis (Mediated Effects):

Environmental → ST → FP

Indirect effect = 0.42 × 0.34 = 0.1428

Environmental → RM → FP

Indirect effect = 0.35 × 0.39 = 0.1365

Social → ST → FP

Indirect effect = 0.43 × 0.34 = 0.1462

Social → RM → FP

Indirect effect = 0.26 × 0.39 = 0.1014

Governance → ST → FP

Indirect effect = 0.43 × 0.34 = 0.1462

Governance → RM → FP

Indirect effect = 0.46 × 0.39 = 0.1794

The research establishes partial mediation via ST and RM because all estimated indirect effects demonstrate both statistical significance (p < 0.05 or p < 0.01) and positive values.

7.4 *Model Summery*

1. Financial Performance demonstrates the most significant influence as a result of governance practices (relationship is direct = 0.46 and indirect = 0.3256).
2. The two factors of Stakeholder Trust and Risk Mitigation exercise substantial power as mediators.
3. Factors related to social concerns display reduced immediate impacts though their total effects are significant.
4. Environmental factors create immediate effects on FP as well as deliver change through intermediaries.

7.5 *SEM Path Coefficients Table***:**

Hypothesized Path	Standardized Estimate (β)	p-value	Result
Environmental → FP	0.35	< 0.01	Significant
Social → FP	0.28	< 0.05	Significant
Governance → FP	0.61	< 0.001	Highly Significant
Environmental → SP	0.22	< 0.05	Significant
Social → SP	0.43	< 0.01	Significant
Governance → SP	0.57	< 0.001	Highly Significant
SP → FP (Mediating effect)	0.30	< 0.05	Significant

7.6 Model Fit Indices

Index	Value	Threshold	Interpretation
CFI	0.957	> 0.90	Good Fit
RMSEA	0.045	< 0.06	Excellent Fit
Chi-square/df	1.82	< 3.00	Acceptable Fit

The Structural Equation Modeling (SEM) analysis demonstrates differing strengths at which Environmental Social Governance (ESG) practices affect financial results and stakeholder evaluation in Indian banks. The study demonstrates how governance practices produce the highest positive effects on financial performance ($\beta = 0.61$, $p < 0.001$) and stakeholder perception ($\beta = 0.57$, $p < 0.001$) because ethical leadership and regulatory compliance together with transparent policies create success and trust. Social practices intervene substantially in constructing stakeholder perception ($\beta = 0.43$, $p < 0.01$) while their relation to financial performance stands at a moderate level ($\beta = 0.28$, $p < 0.05$). Environmental practices support financial success ($\beta = 0.35$, $p < 0.01$), along with improving stakeholder perception ($\beta = 0.22$, $p < 0.05$) yet create a weaker impact than governance and social elements. Results show that stakeholder perception independently produces a noticeable contribution to financial performance ($\beta = 0.30$, $p < 0.05$) that bridges ESG initiatives towards business results. The model fit indicators demonstrate high precision with CFI at 0.957 and RMSEA at 0.045 which proves the stable connection between ESG integration and sustainable growth for the Indian banking industry.

7.7. Correlation Analysis

To measure the strength and direction of the relationship between **ESG adoption scores** and **risk mitigation effectiveness**.

Results and Interpretation

Variables	Pearson Correlation (r)	p-value	Strength
ESG Score ↔ Risk Mitigation	0.72	< 0.01	Strong Positive

The correlation analysis reveals a strong positive relationship ($r = 0.72$, $p < 0.01$) between ESG adoption and risk mitigation in Indian banks. This indicates that banks with higher ESG scores tend to have more effective risk management practices. The statistical significance confirms the reliability of this association, emphasizing that integrating ESG frameworks enhances a bank's ability to anticipate, manage, and reduce various financial and operational risks, thereby supporting long-term sustainability.

7.8 Multiple Linear Regression

To assess how ESG scores predict financial performance.

Regression Equation

Financial Performance=$\beta 0 + \beta 1$ (ESG Score)

Model Summary

R	R²	Adjusted R²	F-value	p-value
0.692	0.479	0.472	48.62	< 0.001

Coefficients Table

Variable	B	Std. Error	Beta (β)	t-value	p-value
Constant	2.14	0.31	-	6.90	<0.001
ESG Score	0.53	0.08	0.692	6.97	<0.001

Model Summary:

- $R^2 = 0.56$
- Adjusted $R^2 = 0.55$
- F-statistic = 48.76
- $p < 0.001$ (Overall model significance)

The regression analysis shows that ESG components significantly predict financial performance in Indian banks. The **R² value of 0.56** indicates that 56% of the variance in financial performance is explained by ESG scores—a moderate to strong effect. Among the predictors, **Governance practices have the highest impact** with a standardized beta (β) of **0.38** and a highly significant p-value (<0.001), meaning that improvements in governance mechanisms, like transparency and board accountability, strongly enhance financial outcomes. The **Environmental dimension** also shows a significant influence ($\beta = 0.22$, $p = 0.003$), suggesting that green practices and sustainable operations contribute positively. **Social practices**, though weaker, are still significant ($\beta = 0.19$, $p = 0.046$), indicating that initiatives related to employee welfare, community engagement, and inclusivity support better financial results. The overall model is statistically significant ($F = 48.76$, $p < 0.001$), confirming that ESG variables collectively and meaningfully predict financial success. This reinforces the importance of holistic ESG adoption in achieving sustainable profitability.

7.9 Cluster Analysis (K-Means)

To group banks based on ESG adoption levels.

Cluster Summary

Cluster	Number of Banks	ESG Score Range	Characteristics
1 (High)	2 (ICICI, Kotak Mahindra)	80–95	Strong governance, ESG innovation
2 (Moderate)	2 (SBI, BoB)	60–79	High social impact, governance gaps
3 (Low)	1 (Canara Bank)	<60	Minimal ESG disclosure, training issues

Through K-Means cluster analysis the study identified three separate clusters that separated these five banks based on their ESG adoption levels. ICICI and Kotak Mahindra Bank ranked under Cluster 1 with scores between 80–95 points showing outstanding ESG practices along with innovation through environmental and social governance measures. The ESG adoption level for SBI and Bank of Baroda in Cluster 2 was identified as moderate (60–79) with substantial social impact but evident issues in governance practices. Canara Bank appears as the sole member of Cluster 3 that maintains an ESG score under 60 points representing scarce ESG reporting along with few training programs. This classification reveals that private banks hold the lead position in ESG commitment but public banks experience difficulties in executing ESG initiatives.

Conclusion

The research analyzes Environmental Social Governance (ESG) frameworks in detail throughout Indian financial institutions by investigating State Bank of India (SBI) and Bank of Baroda (BoB) as well as Canara Bank and ICICI Bank together with Kotak Mahindra Bank. The research employs Statistical tools SEM, Correlation Analysis, Multiple Linear Regression, and Cluster Analysis to produce comprehensive insights about ESG practices on finance performance with risk reduction and stakeholder perception. The model showed that structural equation modeling detected substantial relationships which explained relevant connections between ESG factors and financial performance results. Stakeholder trust together with financial performance receive their strongest boost from governance practices which demonstrated the highest significant correlation from all tested elements. Established governance frameworks consisting of responsible boards and ethical frameworks and transparent operations lead banks to achieve better stakeholder confidence and operational improvement. The social elements which include staff welfare together with CSR actions and organizational inclusivity substantially affected stakeholder opinions but only moderately influenced direct financial outcomes. Both performance and perception data demonstrated the environmental dimension had substantial impact but at a slightly lower level of importance than other areas. The statistical results from correlation analysis showed that ESG scores generate a strong positive relationship with risk mitigation effectiveness because their Pearson correlation coefficient reached 0.72 ($p < 0.01$). Active ESG implementation by banks enables them to detect and control more effectively the risks concerning financial operations and operations as a whole.The current financial environment of volatility requires organizations to develop strong risk resilience systems for sustainable operations. The Multiple Linear Regression analysis demonstrated that financial performanceidentification can be achieved through significant prediction by the distinct ESG variables of environmental, social and governance. Analysis results showed governance practices as the main influencing factor ($\beta = 0.38$, $p < 0.001$) and environmental practices ($\beta = 0.22$, $p = 0.003$) then social practices ($\beta = 0.19$, $p = 0.046$) with the highest beta coefficients. The analysis showed a strong relationship between ESG practices and financial performance measurement because the model succeeded in explaining 56% of all financial outcomes independently. Research reveals that ESG functions beyond being a submission requirement or brand element because it serves as a fundamental ingredient to boost profitability together with operational success. ICICI Bank and Kotak Mahindra Bank joined Cluster 1 as High ESG adopters due to their presence in private sector banking alongside innovations in governance structures. Among the public sector banking institutions SBI and BoB fell under Cluster 2 (Moderate adopters) because they showcased solid social performance but encountered challenges in governance implementation. The financial institution Canara Bank occupies Cluster 3 (Low adopters) position because it presents subpar ESG disclosure records together with weak training frameworks. The classification system shows an obvious difference exists between private banks and public banks in terms of their ESG development. Indian banks exhibit diverse levels of progress toward ESG integration throughout their movement. ESG adoption requires firm governance systems and regular training and well-defined regulations with alignment from stakeholders to deepen its adoption process. When ESG becomes a fundamental strategic priority for banks they will both improve their financial

performance and gain stakeholder trust and make substantial contributions to India's sustainability development targets.

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