# The Role of Digital Transformation in Advancing Green Banking Practices Through Environmental Factors Mental, Social and Governance Factors (ESG) Integration

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*Abstract*

*The following paper aims at understanding how factors of environmental, social and governance (ESG) impact green banking in the financial industry. As sustainability has emerged as a key global theme, banks are gradually incorporating ESG factors into their activities to meet the urgent needs of the world, for example, climate change, resource depletion, and social justice. The study focuses on the effects of the environment on sustainable banking, the effects of social aspects, and the effects of governance structures on sustainable banking practices. A pilot study followed by data collection from questionnaires, interviews, and documents was used to test the research model and SEM analysis was used to test the hypotheses between ESG factors and green banking adoption. The study also reveals that the environmental factors are the most influential factors for promoting Green banking practices with social and governance factors influencing they are different but are interrelated in promoting green banking practices. These findings are in line with the Literature supporting a systems perspective on integrating ESG factors in order to promote sustainability. The study enriches the existing literature on green banking and provides important policy implications for policymakers, financial institutions, and stakeholders to promote sustainable development with the principles of responsible banking. It also presents the basis for further research to analyze the factors within the region and the technical advancement that can be applied in the banking industry as well as the long-term effects and sustainability of the results.*

*Keywords:*

*ESG Integration, Green Banking Practices, Digital Transformation*

## Introduction:

Sustainability has become one of the biggest challenges and themes in the global society and aims at attaining a balance between the economy, environment and the society. It considers the use of resources to the optimum for current Generations' requirements while also preserving comparable potential for the next Generations. The concept of sustainability has therefore gone beyond being an environmental issue, but also entails social responsibility and public policy that prevents vices such as corporate fraud and embezzlement. Since the effects of environmental pollution, climate change, and resource depletion remain a challenge, the emphasis on sustainability has increased over the years, and as a result, has brought changes in the policy, practice and expectation from stakeholders. Companies and organizations globally are now being encouraged to embrace corporate responsibility for their effects on the physical environment, people, and the economy.

In this respect, the financial sector has a critical position. Lenders and financial institutions are in a particularly good place to lead change because they control the flow of funds and can steer them toward more sustainable activities. Recently, globalization has led to a focus on environmental, social, and governance (ESG) issues as key parameters for defining business and Operational strategies. Taking into account ESG factors establishes a clear set of guidelines for evaluating the effects of business processes, the cultivation of sustainable business models, and compliance with the goals set for sustainable development at the worldwide level. Since the financial sector is at the center of resource mobilization and economic growth, banking activities have become one of the significant areas that incorporate ESG principles (Hidayat, 2018).

Green banking, as a sustainable idea has become a significant concept in the banking industry, for the purpose of implementing the sustainable green banking business strategies. Green banking as a concept looks to bankers address these challenges within the broad umbrella of sustainable development through economic development while addressing climate change and resource conservation as well as social justice. It is a complete change of direction in the way that banks operate, away from the crude profit motive and towards a new framework that takes into account the protection of the natural world, support for communities, and the promotion of sound governance as fundamental values. This increasing focus on green banking underlines the centrality of the financial sector in the ongoing process of creating sustainable development, transforming of the concept of a traditional bank, and promoting sustainability in the global economy (Gunawan et al., 2022).

The purpose of this research study is to assess the level of ESG factors that determine the green banking practices. In more detail, it seeks to assess the Moderating role of the environment on green banking adoption, examine the antecedent influence of social dimension on green banking implementation, and assess the Moderating effect of governance on green banking implementation. These interrelated objectives aim to offer a systematic analysis of the important factors that explain green banking and their implications for sustainability in the financial industry.

## Review of Literature:

Using bibliometric and scientific metric techniques, Gonzalez-Ruiz et al. (2024) outline trends and authors active in the ESG banking field. They stress that ESG is a cross-sectional issue, pointing to topics such as ESG and returns, geographical specificity of integration, and credit risk aspects. The study by Kolk and Perego (2014) enriches theoretical concepts by analyzing sustainable bonuses and their possibility as instruments of corporate responsibility, whereas, the study by Li and his co-authors (2021) investigates the relationship between green energy misfit and economic growth in China, offering frameworks that can inform sustainable banking strategies. Combined, these papers highlight the importance of theoretical and empirical developments of ESG integration in the banking industry.

Raval (2024) Discussed ESG principles and regulations in the banking sector, some of the issues include compliance, reporting and risk management. In addition, extending the governance factors aspect, Bose et al. (2018) highlight institutional and regulatory factors that shape green banking

disclosers and accountability. According to Gunawan et al. (2022), the governance factors mechanisms affect the extent to which green banking disclosures influence sustainability. Together, these papers assert that strong governance factors frameworks are necessary for achieving proper ESG integration and the pursuit of additional sustainable development goals.

Chernykh et al. (2024) concentrate on ESG financing instruments, such as green bonds and sustainability-linked loans to evaluate their impact on regional infrastructure. Hidayat (2018) also mentioned similar practices in Indonesia, where green banking is also applied to promote renewable energy and biodiversity. These works show that ESG financing instruments may greatly enhance the sustainable regional development with the support of the regulatory environment and the awareness of stakeholders.

Zeb (2024) assesses the level of relationship between ESG activities and Operational efficiency using Islamic and conventional banks. The research captures different impacts of ESG initiatives because of the varying working models and legal standards. Mangla et al, (2015) discuss green banking in India with a focus on its efficiency in the promotion of sustainability despite the barriers. These studies give an indication of how ESG affects efficiency and performance in various banking systems and geographical locations.

**Research Methodology:**

The purpose of the study was to assess the correlation between environmental factors and the green banking practice; mental, social and governance factors. To that end, the research strategy was used based on certain elements including sample, participant characteristics, data collection methods, and analysis tools. The research Used 300 observations from a convenient sample population that included the banking sector. The target audience was banking officials and stakeholders, decision-makers, and influencers like the CSO, Corporate Affairs Director, Head of Risk Management, Head of Compliance, and Head of Human Resources. The variability of the participants guaranteed broad views of multiple roles and positions, which increased the credibility and applicability of the study.

The type of research Used in the study was quantitative because the researcher sought to establish the extent of the connection between the research predictors and the outcome variable. Surveys, interviews, and documents were used in data collection from July 15, 2024 to September 13, 2024. Questionnaires were administered among the identified participants and interviews were conducted among such personnel as the CSO and Corporate Affairs Director. Moreover, in order to support the findings and place them into context, relevant documents, reports, and policies that address green banking were also analyzed.

To analyze the collected data, the Structural Equation Modeling (SEM) technique was used in the study since it enabled the study to establish the relationships between the ESG factors and green banking practices with more depth. Such an approach provided important information about factors and processes that affect the implementation of sustainable standards within the sphere of banking activity.

**Results:**

**Table-1 Models Info**

| Estimation Method | ML |
|---|---|
| Optimization Method | NLMINB |
| Number of observations | 300 |
| Model | Environmental factors =~REEI1+REEI2+REEI3+CFRR1+CFRR2+CFRR3+WMRR1+WMRR2+WMRR3+ERAA1+ERAA2+ERAA3 |
| | Social factors=~CEDD1+CEDD2+CEDD3+SIII1+SIII2+SIII3+FIAA1+FIAA2+FIAA3+SEDD1+SEDD2+SEDD3 |
| | Governance factors =~BDII1+BDII2+BDII3+TADD1+TADD2+TADD3 |
| | Banking =~ECIII+ECII2+ECII3+ERBEI1+ERBEI2+ERBEI3+ERBEI4+IREEI1+IREEI2+CEOO1+CEOO2 |
| | Banking ~Environmental factors +Governance factors +Social factors |

Table 1 provides an overview of the models and methods used in the analysis. The estimation method employed is Maximum Likelihood (ML), and the optimization was performed using the NLMINB algorithm. The dataset consists of 300 observations. The model evaluates multiple latent constructs, including **Environmental factors**, which are measured by indicators such as REEI1, REEI2, REEI3, CFRR1, CFRR2, CFRR3, WMRR1, WMRR2, WMRR3, ERAA1, ERAA2, and ERAA3. **Social factors** are assesSEDD through variables like CEDD1, CEDD2, CEDD3, SIII1, SIII2, SIII3, FIAA1, FIAA2, FIAA3, SEDD1, SEDD2, and SEDD3. **Governance factors** include indicators like BDII1, BDII2, BDII3, TADD1, TADD2, and TADD3. The construct of **Banking** is modeled through variables such as ECIII, ECII2, ECII3, ERBEI1, ERBEI2, ERBEI3, ERBEI4, IREEI1, IREEI2, CEOO1, and CEOO2. Furthermore, the Banking construct is influenced by Environmental, Governance, and Social factors, emphasizing the interconnected nature of these domains in the model framework.

**Overall Tests:**

**Table-2 Model tests**

| Label | $X^2$ | df | p |
|---|---|---|---|
| User Model | 3471 | 773 | < .001 |
| Baseline Model | 5521 | 820 | < .001 |

The results of model testing are stated in Table 2, with the User Model being compared to the Baseline Model. The fit of the User Model is statistically significant chi-square value ($X^2$ = 3471) with 773 df, and p < 0.001. Likewise, the Baseline Model yields a chi-square value of 5521 and degrees of freedom at 820; the p-value was less than .001. These results imply that both models are far from the perfect fit, and the User Model outperforms the Baseline Model relatively because the former has a greater number of chi-squares and lower degrees of freedom than the latter.

**Table-3 Fit indices**

| | | 95% Confidence Intervals | | |
|---|---|---|---|---|
| SRMR | RMSEA | Lower | Upper | RMSEA p |
| 0.107 | 0.108 | 0.104 | 0.112 | < .001 |

Table 3 gives the fit indices of the model by considering SRMR and RMSEA with the help of their confidence intervals and Significance levels. On average, the observed and predicted correlations deviate from each other by 0.107, which is the value of the Standardized Root Mean Square Residual (SRMR). RMSEA is 0.108, and the 90CI for RMSEA is 0.104 to 0.112 indicating the amount of error in the model approximation. This shows a statistical significance of the fit measure with the p-value in RMSEA being less than .001. These indices indicate that in some ways, the model is an approximation of the data but there is certainly scope for improving the fit.

**Table-4 Parameters Estimates**

| Dep | Pred | Estimate | SE | 95% Confidence Intervals | | β | z | p |
|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | | | |
| Banking | Environmental factors | 0.216 | 0.0506 | 0.11681 | 0.315 | 0.296 | 4.27 | < .001 |
| Banking | Governance factors | 0.133 | 0.0634 | 0.00826 | 0.257 | 0.139 | 2.09 | 0.037 |
| Banking | Social factors | 0.128 | 0.0498 | 0.03055 | 0.226 | 0.17 | 2.57 | 0.01 |

The analysis of parameter estimates reveals the relationships between environmental, social, and governance (ESG) factors and the adoption of banking practices. Each factor positively influences banking adoption, but the magnitude and statistical significance of their effects differ. Environmental factors exhibit the strongest and most statistically significant impact on banking adoption, with an estimate of 0.216 and a standardized beta (â) of 0.296, indicating a moderate influence in standardized units. The 95% confidence interval, ranging from 0.11681 to 0.315, confirms the robustness of this effect. A z-value of 4.27 and a p-value of less than 0.001 underscore the high statistical significance of environmental factors, highlighting their critical role in promoting sustainable banking practices.

Social factors also demonstrate a statistically significant positive influence, with an estimate of 0.128 and a standardized beta (â) of 0.170, reflecting a Moderate impact. The 95% confidence interval for social factors, ranging from 0.03055 to 0.226, indicates reasonable confidence in the observed effect. The z-value of 2.57 and p-value of 0.010 further confirm the significance of social factors, suggesting their importance in driving banking adoption, albeit to a lesser extent than environmental Considerations.

Governance factors, while positively influencing banking adoption, exhibit the weakest impact among the three variables, with an estimate of 0.133 and a standardized beta (â) of 0.139, indicating a relatively small effect size. The 95% confidence interval for governance factors ranges from 0.00826 to 0.257, reflecting greater variability in the estimated effect and a weaker confidence in its magnitude. However, the z-value of 2.09 and p-value of 0.037 indicate statistical significance, confirming that governance factors play a role in influencing banking practices, albeit with less robustness compared to environmental and social factors.

Overall, the findings highlight that environmental factors have the most substantial and reliable impact on the adoption of banking practices, followed by social factors, with governance factors contributing the least. This implies that although all the ten ESG dimensions are relevant, a strategic focus on environmental factors is central to the promotion of sustainable banking. In the same way, integration of social and governance issues may improve the effectiveness of environmental actions and augment the effect on banking adoption. The findings of this study offer important recommendations to the stakeholders and policymakers when developing policies for the incorporation of ESG factors into the banking sector.
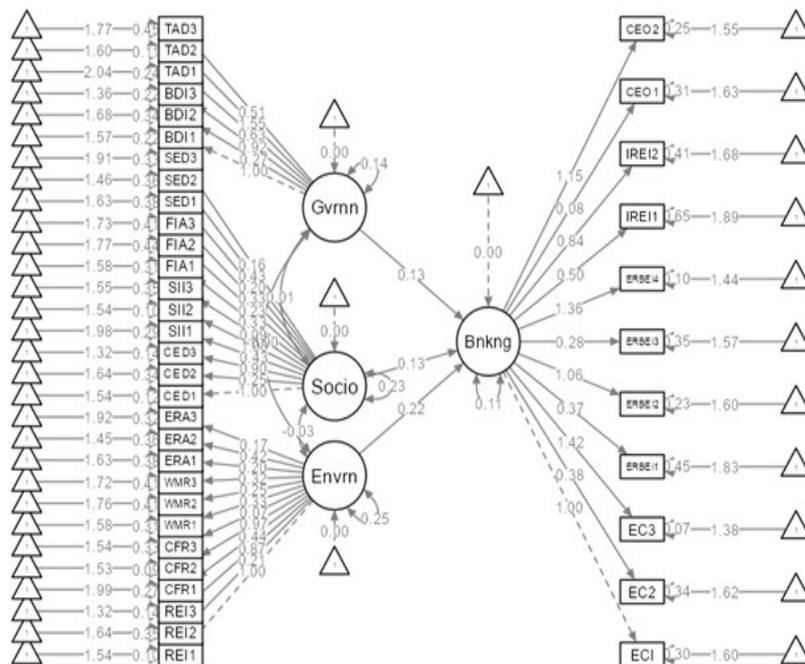
**Path diagrams**

**Table-5 Measurement model**

| Latent | Observed | Estimate | SE | 95% Confidence Intervals | | β | z | p |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | Lower | Upper | | | |
| Environmental factors | REEI1 | 1 | 0 | 1 | 1 | 0.839 | | |
| | REEI2 | 0.2124 | 0.0739 | 0.0675 | 0.357 | 0.1763 | 2.873 | 0.004 |
| | REEI3 | 0.8678 | 0.0623 | 0.7457 | 0.99 | 0.7534 | 13.929 | <.001 |
| | CFRR1 | 0.4378 | 0.0682 | 0.3041 | 0.572 | 0.3833 | 6.416 | <.001 |
| | CFRR2 | 0.97 | 0.0621 | 0.8482 | 1.092 | 0.8463 | 15.609 | <.001 |
| | CFRR3 | 0.0743 | 0.0722 | -0.0671 | 0.216 | 0.0636 | 1.03 | 0.303 |
| | WMRR1 | 0.3299 | 0.0711 | 0.1906 | 0.469 | 0.2817 | 4.641 | <.001 |
| | WMRR2 | 0.2492 | 0.0803 | 0.0919 | 0.407 | 0.1903 | 3.104 | 0.002 |
| | WMRR3 | 0.3166 | 0.0814 | 0.1571 | 0.476 | 0.2374 | 3.89 | <.001 |
| | ERAA1 | 0.1993 | 0.0779 | 0.0466 | 0.352 | 0.1572 | 2.559 | 0.011 |
| | ERAA2 | 0.4208 | 0.0771 | 0.2697 | 0.572 | 0.3291 | 5.458 | <.001 |
| | ERAA3 | 0.1651 | 0.0713 | 0.0253 | 0.305 | 0.1424 | 2.315 | 0.021 |
| Social factors | CEDD1 | 1 | 0 | 1 | 1 | 0.811 | | |
| | CEDD2 | 0.2524 | 0.0773 | 0.101 | 0.404 | 0.2022 | 3.266 | 0.001 |
| | CEDD3 | 0.8964 | 0.0681 | 0.7629 | 1.03 | 0.7535 | 13.156 | <.001 |
| | SIII1 | 0.4343 | 0.0736 | 0.2901 | 0.578 | 0.3603 | 5.905 | <.001 |
| | SIII2 | 0.9959 | 0.0699 | 0.8589 | 1.133 | 0.8315 | 14.245 | <.001 |
| | SIII3 | 0.0882 | 0.0775 | -0.0636 | 0.24 | 0.0709 | 1.138 | 0.255 |
| | FIAA1 | 0.33 | 0.0747 | 0.1836 | 0.476 | 0.2721 | 4.419 | <.001 |
| | FIAA2 | 0.2325 | 0.0875 | 0.0611 | 0.404 | 0.1649 | 2.658 | 0.008 |
| | FIAA3 | 0.3335 | 0.0851 | 0.1667 | 0.5 | 0.2419 | 3.919 | <.001 |
| | SEDD1 | 0.2033 | 0.0812 | 0.0441 | 0.363 | 0.1554 | 2.503 | 0.012 |
| | SEDD2 | 0.4296 | 0.0812 | 0.2706 | 0.589 | 0.3244 | 5.294 | <.001 |
| | SEDD3 | 0.1638 | 0.0756 | 0.0156 | 0.312 | 0.1346 | 2.166 | 0.03 |
| Governance factors | BDII1 | 1 | 0 | 1 | 1 | 0.6318 | | |
| | BDII2 | 0.2683 | 0.1006 | 0.0712 | 0.465 | 0.1712 | 2.668 | 0.008 |
| | BDII3 | 0.9209 | 0.1092 | 0.7069 | 1.135 | 0.5996 | 8.436 | <.001 |
| | TADD1 | 0.6348 | 0.0972 | 0.4444 | 0.825 | 0.4422 | 6.534 | <.001 |
| | TADD2 | 1.551 | 0.1678 | 1.2221 | 1.88 | 0.8713 | 9.242 | <.001 |
| | TADD3 | 0.5083 | 0.12 | 0.2732 | 0.743 | 0.2761 | 4.237 | <.001 |
| Banking | ECIII | 1 | 0 | 1 | 1 | 0.5538 | | |
| | ECII2 | 0.3771 | 0.1048 | 0.1716 | 0.583 | 0.2269 | 3.596 | <.001 |
| | ECII3 | 1.4223 | 0.1414 | 1.1452 | 1.699 | 0.887 | 10.059 | <.001 |
| | ERBEI1 | 0.3695 | 0.1178 | 0.1387 | 0.6 | 0.1964 | 3.138 | 0.002 |
| | ERBEI2 | 1.0585 | 0.1278 | 0.8081 | 1.309 | 0.6211 | 8.283 | <.001 |
| | ERBEI3 | 0.2836 | 0.103 | 0.0817 | 0.485 | 0.1713 | 2.754 | 0.006 |
| | ERBEI4 | 1.3601 | 0.1376 | 1.0903 | 1.63 | 0.8445 | 9.882 | <.001 |
| | IREEI1 | 0.4992 | 0.144 | 0.217 | 0.781 | 0.2182 | 3.468 | <.001 |
| | IREEI2 | 0.8398 | 0.1329 | 0.5792 | 1.1 | 0.4301 | 6.318 | <.001 |
| | CEOO1 | 0.0784 | 0.0945 | -0.1067 | 0.264 | 0.0508 | 0.83 | 0.406 |
| | CEOO2 | 1.1471 | 0.1358 | 0.8809 | 1.413 | 0.6399 | 8.446 | <.001 |

Table 5 outlines the measurement model, detailing the relationships between latent constructs (Environmental factors, Social factors, Governance factors, and Banking) and their observed indicators. The table presents estimates, standard errors (SE), confidence intervals (lower and upper bounds), standardized factor loadings (â), z-values, and p-values.

For **Environmental factors**, indicators such as REEI1, CFRR2, and WMRR1 show strong and significant loadings, with â values like 0.839, 0.8463, and 0.2817, respectively. However, some indicators, such as CFRR3 and WMRR2, have lower or non-significant p-values (e.g., 0.303), indicating weaker contributions.

For **Social factors**, indicators like CEDD1 and SIII2 exhibit high loadings, with â values of 0.811 and 0.8315, respectively, and are statistically significant (p < .001). Conversely, SIII3 has a non-significant p-value (0.255), suggesting limited influence.

**Governance factors** show significant contributions from indicators such as TADD2 and BDII3, with â values of 0.8713 and 0.5996, respectively. All governance indicators, except for TADD3 (p = < .001), strongly support the latent construct.

For **Banking**, indicators like EC3 and ERBEI4 display high factor loadings, with â values of 0.887 and 0.8445, respectively, and significant z-values (p < .001). However, some indicators, such as CEOO1, exhibit weak contributions (â = 0.0508, p = 0.406).

Overall, the measurement model highlights significant relationships between latent constructs and their respective indicators, with a few observed variables showing weaker or non-significant associations.

**Table 6 Variances and Covariance**

| Variable 1 | Variable 2 | Estimate | SE | 95% Confidence Intervals | | β | z | p |
|---|---|---|---|---|---|---|---|---|
| | | | | Lower | Upper | | | |
| REEI1 | REEI1 | 0.10314 | 0.0136 | 0.07651 | 0.12977 | 0.296 | 7.591 | <.001 |
| REEI2 | REEI2 | 0.34506 | 0.0283 | 0.28958 | 0.40053 | 0.9689 | 12.19 | <.001 |
| REEI3 | REEI3 | 0.14073 | 0.0144 | 0.11252 | 0.16895 | 0.4324 | 9.776 | <.001 |
| CFRR1 | CFRR1 | 0.27294 | 0.0229 | 0.22813 | 0.31775 | 0.8531 | 11.938 | <.001 |
| CFRR2 | CFRR2 | 0.09145 | 0.0125 | 0.06701 | 0.11589 | 0.2838 | 7.334 | <.001 |
| CFRR3 | CFRR3 | 0.33371 | 0.0273 | 0.28028 | 0.38715 | 0.996 | 12.24 | <.001 |
| WMRR1 | WMRR1 | 0.3097 | 0.0256 | 0.2595 | 0.35989 | 0.9207 | 12.093 | <.001 |
| WMRR2 | WMRR2 | 0.40543 | 0.0333 | 0.34019 | 0.47066 | 0.9638 | 12.18 | <.001 |
| WMRR3 | WMRR3 | 0.4118 | 0.0339 | 0.34532 | 0.47828 | 0.9437 | 12.141 | <.001 |
| ERAA1 | ERAA1 | 0.38422 | 0.0315 | 0.3225 | 0.44593 | 0.9753 | 12.202 | <.001 |
| ERAA2 | ERAA2 | 0.35772 | 0.0297 | 0.29944 | 0.416 | 0.8917 | 12.03 | <.001 |
| ERAA3 | ERAA3 | 0.32304 | 0.0265 | 0.27118 | 0.37489 | 0.9797 | 12.211 | <.001 |
| CEDD1 | CEDD1 | 0.11927 | 0.0149 | 0.09007 | 0.14847 | 0.3423 | 8.006 | <.001 |
| CEDD2 | CEDD2 | 0.34246 | 0.0282 | 0.28727 | 0.39766 | 0.9591 | 12.161 | <.001 |
| CEDD3 | CEDD3 | 0.14015 | 0.0149 | 0.11099 | 0.1693 | 0.4322 | 9.421 | <.001 |
| SIII1 | SIII1 | 0.28971 | 0.0243 | 0.24217 | 0.33726 | 0.8702 | 11.944 | <.001 |
| SIII2 | SIII2 | 0.10141 | 0.0138 | 0.07436 | 0.12846 | 0.3086 | 7.347 | <.001 |
| SIII3 | SIII3 | 0.35271 | 0.0288 | 0.29622 | 0.4092 | 0.995 | 12.237 | <.001 |
| FIAA1 | FIAA1 | 0.31199 | 0.0258 | 0.26139 | 0.36259 | 0.926 | 12.085 | <.001 |
| FIAA2 | FIAA2 | 0.4429 | 0.0363 | 0.3717 | 0.51411 | 0.9728 | 12.191 | <.001 |
| FIAA3 | FIAA3 | 0.41006 | 0.0338 | 0.34376 | 0.47637 | 0.9415 | 12.121 | <.001 |
| SEDD1 | SEDD1 | 0.38275 | 0.0314 | 0.32125 | 0.44426 | 0.9759 | 12.197 | <.001 |
| SEDD2 | SEDD2 | 0.35969 | 0.03 | 0.30098 | 0.4184 | 0.8948 | 12.008 | <.001 |
| SEDD3 | SEDD3 | 0.33301 | 0.0273 | 0.27956 | 0.38647 | 0.9819 | 12.21 | <.001 |
| BDII1 | BDII1 | 0.21562 | 0.0216 | 0.1732 | 0.25804 | 0.6008 | 9.962 | <.001 |
| BDII2 | BDII2 | 0.34181 | 0.0281 | 0.28675 | 0.39686 | 0.9707 | 12.169 | <.001 |
| BDII3 | BDII3 | 0.21649 | 0.0208 | 0.17568 | 0.25729 | 0.6405 | 10.398 | <.001 |
| TADD1 | TADD1 | 0.23758 | 0.0206 | 0.19726 | 0.2779 | 0.8045 | 11.55 | <.001 |
| TADD2 | TADD2 | 0.10933 | 0.0292 | 0.05216 | 0.1665 | 0.2408 | 3.748 | <.001 |
| TADD3 | TADD3 | 0.44854 | 0.0373 | 0.37545 | 0.52164 | 0.9238 | 12.027 | <.001 |
| ECIII | ECIII | 0.29583 | 0.0255 | 0.24583 | 0.34583 | 0.6934 | 11.597 | <.001 |
| ECII2 | ECII2 | 0.34285 | 0.0282 | 0.28763 | 0.39807 | 0.9485 | 12.169 | <.001 |
| ECII3 | ECII3 | 0.07172 | 0.011 | 0.05014 | 0.0933 | 0.2132 | 6.514 | <.001 |
| ERBEI1 | ERBEI1 | 0.44543 | 0.0365 | 0.3738 | 0.51705 | 0.9614 | 12.189 | <.001 |
| ERBEI2 | ERBEI2 | 0.2334 | 0.0206 | 0.19298 | 0.27383 | 0.6142 | 11.316 | <.001 |
| ERBEI3 | ERBEI3 | 0.34791 | 0.0285 | 0.29204 | 0.40379 | 0.9706 | 12.204 | <.001 |
| ERBEI4 | ERBEI4 | 0.0973 | 0.0119 | 0.07401 | 0.12059 | 0.2867 | 8.187 | <.001 |
| IREEI1 | IREEI1 | 0.65197 | 0.0535 | 0.54701 | 0.75692 | 0.9524 | 12.175 | <.001 |
| IREEI2 | IREEI2 | 0.40653 | 0.0341 | 0.33966 | 0.47339 | 0.815 | 11.916 | <.001 |
| CEOO1 | CEOO1 | 0.31142 | 0.0254 | 0.26157 | 0.36127 | 0.9974 | 12.244 | <.001 |
| CEOO2 | CEOO2 | 0.24833 | 0.0221 | 0.20493 | 0.29172 | 0.5906 | 11.216 | <.001 |

Table 6 presents the variances and covariance of latent variables and their observed indicators, along with key statistical metrics such as estimates, standard errors (SE), confidence intervals (lower and upper bounds), standardized coefficients (â), z-values, and p-values.

The variances of individual indicators, such as REEI1 (Estimate = 0.10314, â = 0.296, p < .001) and CFRR1 (Estimate = 0.27294, â = 0.8531, p < .001), are mostly significant, indicating robust variability in the data. Indicators like WMRR3 (Estimate = 0.4118, â = 0.9437, p < .001) and ERAA3 (Estimate = 0.32304, â = 0.9797, p < .001) display particularly high standardized coefficients, suggesting strong reliability.

The variances of latent constructs, including Environmental factors (Estimate = 0.24526, â = 1, p < .001), Social factors (Estimate = 0.22913, â = 1, p < .001), Governance factors (Estimate = 0.14327, â = 1, p < .001), and Banking (Estimate = 0.11437, â = 0.8742, p < .001), are significant, affirming their explanatory power in the model.

Covariances among latent variables Generally show weak or non-significant relationships. For instance, Environmental factors and Social factors exhibit a negative covariance (Estimate = -0.0282, â = -0.119, p = 0.078), which is not statistically significant. Similarly, Environmental factors and Governance factors (Estimate = -0.0035, â = -0.0187, p = 0.784) and Social factors and Governance factors (Estimate = 0.01466, â = 0.0809, p = 0.242) display non-significant associations.

Overall, the table highlights strong variance within individual indicators and constructs while indicating limited covariance between latent variables, suggesting independence among the constructs in the model.

**Discussion and Conclusion:**

The following research questions were used in the study: What is the impact of ESG factors on the decision to embrace green banking practices? In particular, it aimed to examine the Moderating effect of the environment on green banking, examine the Moderating role of social factors, and examine the relationship between governance issues and sustainable banking. The research analysis showed that all the three aspects of ESG had a positive effect on the green banking practices though with varying importance and strength.

In this regard, it was found that the environmental dimension exerted the greatest significant impact on the implementation of green banking practices. This study has shown that, the level of commitment to sustainable banking was higher among those banks that placed high value on environmental factors like carbon footprint, financing of renewable energy, and the implementation of environmentally friendly policies. These results supported current Literature, including Hidayat (2018) which stressed the significance of environmental responsibility for green banking practices and Gunawan et al. (2022) which underlined the relation between environmental reports and sustainability in the banking industry.

The study also revealed that social factors influenced the adoption and implementation of green banking practices. The study also highlighted the fact that banks that were committed to the promotion of financial inclusion, development of their local communities, and addressing other social challenges through responsible lending were in a position to show how they were in sync with the green banking initiatives. These findings supported the findings of Dhingra and Mittal (2014) on the importance of social responsibility in the Indian banking industry and Pawar and Yunuswamy (2022) on the impact of customer trust and satisfaction on green banking.

The study established that the governance factors have some significant but relatively weaker impact on the green banking practices. Good governance, as was evident in the banking sector, in terms of transparency and accountability and ethical decision-making offered a good model for the

implementation of ESG in the banking business. The results of this study were in line with the research conducted by Bose et al. (2018) on governance mechanisms to improve green banking disclosures and Raval (2024) on the centrality of governance structures in integrating banking Operations with sustainability.

The study found out that environmental factors provided a major impetus to green banking adoption, highlighting the need for environmental concerns to be central to the existing banking strategies for the improvement of sustainability goals. This was supported by social factors which focused on Interacting with people, Interacting with the society, and the role of properly managing the financial sphere for the sustainable development of society. Although governance factors are considered to be the base for the development of sustainable banking, they acted as a facilitator – the guidelines provided promoted accountability and sustainable culture in the banking industry. Altogether, the study showed the interdependency of ESG factors in addressing sustainable banking and thereby providing evidence that a more integrated approach is likely to be most effective.

These results are in line with prior studies and strengthen the role of ESG integration in banking, which is a rapidly growing trend. For example, Kolk and Perego, (2014), Li, et al., (2021) and others have stressed that the integration of environmental and social responsibilities together with effective governance can provide essential support for achieving sustainable development goals. The findings of this study add to the Literature by offering a quantitative investigation of the Antecedents of ESG dimensions to green banking practices and offering practical advice for authorities and banks interested in promoting sustainability in the banking industry.

**Study Implication:**

The results of the study have important policy implications for policymakers, banking institutions, stakeholders, and researchers as it identifies ESG factors as important in promoting green banking. Policymakers are urged to establish sound legal and market mechanisms and incentives to promote an environmentally friendly, socially responsible and well-governed banking industry; ESDs become mandatory to provide more reliable information. To ensure that the sustainability goals are achieved, banking institutions should ensure that they factor ESG factors in their business strategies, support sustainable technologies, support financial inclusion and ensure that they have sustainably ethical and transparent policies. This paper aims to give investors and stakeholders practical insights into how they may engage and make informed decisions to support banks with good ESG profiles, and thus bring about greater responsibility and sustainability. Future studies can expand on these findings by looking at regional factors and the effects of ESG in the long term, and business schools can equip future Generations of managers and executives with knowledge of ESG. In sum, the research calls for the collective effort of every stakeholder in the realization of environmental conservation, social justice and economic sustainability as Enhanced by the sustainable banking practices.

**Future Scope of the study:**

The study provides an opportunity for future studies to expand the analysis of how ESG factors relate to green banking practices. Subsequent research may focus on country-specific factors in order to uncover how cultural, economic and legal differences affect the implementation of ESG aspects within diverse banking structures. More specifically, more longitudinal studies could be conducted in order to evaluate the efficacy of ESG-driven activities in terms of both financial performance and the occurrence of sustainable events in the long run. Furthermore, investigating how blockchain and artificial intelligence could be Used to improve ESG compliance and green banking could give the study a fresh perspective. Research in other industries apart from the banking sector may show how other sustainability concepts related to ESG can be applied. Other research could also explore customers'

attitudes and behavioral actions towards ESG activities to have a broader perspective of the stakeholder approach. Moreover, it is possible to extend the analysis by including macro-level variables, for example, economic development or changes in legislation, to investigate the effect on the implementation of effective environmental management. These directions will not only contribute to the knowledge advancement but also offer practical recommendations for those who is interested in the creation of sustainable financial systems.