DRIVERS OF GREEN BANKING ADOPTION: INSIGHTS FROM COMMERCIAL BANKS IN PAKISTAN

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ABSTRACT

The present study seeks to explore the factors influencing the adoption of green banking practices in commercial banks across Pakistan. It also evaluates the potential relationship between these identified factors (economic factors, stakeholders' pressure and loan demand) and implementation of green banking practices. Current study is quantitative research based on structure equation model techniques to attain the objectives. Data is collected from banks' employees through questionnaire. Before the structure equation model (SEM), initial necessary testing, including convergent validity and confirmatory factor analysis, was also performed. The findings of the SEM model suggest that economic factors, stakeholder pressure and loan demand have significant and positive influences on the adoption of green banking practices in commercial banks. The study is helpful for policymakers, environmentalists, government and regulatory authorities to get insight into the picture before developing and implementing green banking initiatives.

Keywords: Green Banking; Adoption; Economic; Stakeholder; Loan Demand; Structure Equation Model; Commercial Banks; Pakistan.

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1. INTRODUCTION

According to Zhang et al. (2022), the Sustainable Development Goals (SDGs) must be met by 2030 and climate change must be addressed, due to which green banking projects have gained attention due to these recent trends. The idea of human well-being prosperity has turned into a game changer, and multiple environmental concerns have been highlighted. The continuously increasing population is linked with increased consumption of resources and an unstable economy. In order to improve economic conditions and maximize wealth, people are continuously engaged in activities that significantly damage the environment and result in climate changes, including storms, heat waves, floods, tsunamis, unstable sea levels, etc. These climate changes have threatened lifestyle sustainability worldwide, continuously prompting developed and developing countries to collaborate and control this situation immediately (H. Chen et al., 2013). During the last few decades, this ecological inequality has been believed to be directly linked with industrialization. Further, it is also assumed that businesses are continuously growing at the cost of local communities, and these organizations are the main reason behind economic, social, and environmental issues (Porter & Kramer, 2014). Increased pollution has highlighted social concerns for their environment, which has badly influenced agriculture, forestry, water resources, and human health (Zhixia et al., 2018).

The "Green Economy" concept was initially discussed by the United Nations Environmental Program in 2014 and categorized as financing events that lead toward human prosperity and social equity and minimize ecological inequality and associated environmental concerns. In other words, the idea of a green economy indicates efficient resource management, a minimum level of carbon footprints, environmental business operations, and improved social equity. The term "green" represents the allocation of funds to fulfill the financing requirements of environmentally friendly industries, including green operations, green production, social inclusion, and renewable energy as part of major economic sectors (H. W. Lee, 2011). The acknowledgment of environmental concerns at the global level has exerted pressure on major economic sectors and industries, specifically on the financial and banking sectors, to practice environmentally friendly banking activities (Sachs et al., 2019).

Green banking's potential to promote the long-term growth of a green economy makes it associated with a political viewpoint (Sardana, 2021); (Barua, 2020). Although the environment

is not directly related to the way banks operate and their green banking style can influence the environment at a more significant level. Due to the extensive network of branches and services provided by automated teller machines, commercial banks are considered significant consumers of paper, electricity, and many other resources. However, greenhouse financing projects and other digitalized banking services have significantly minimized environmental adverse impacts. Likewise, the concept of a green banking initiative is essential, and practices should be adopted at operational and strategic levels (Rehman et al., 2021).

Green banking initiatives significantly contribute to a green environment by minimizing carbon footprints and encouraging companies to practice energy-efficient technologies (Nanda & Bihari, 2012). Banks are considered more accountable and responsible as significant sources of industry financing. Green banking practices help provide a competitive edge in the market, higher customer retention, and many other social, environmental and corporate advantages (Sarwar et al., 2024). Today, people are more concerned about their environmental and social concerns. Therefore, there is a need to practice green banking policy in their operational activities to remain competitive in the market (Nath et al., 2014).

The banking sector encourages environmentally friendly businesses and acknowledges its importance at the corporate, environmental and social levels, specifically for developing economies worldwide (MD Masukujjaman & Aktar, 2013). Further, green banking practices provide a competitive edge regarding customer trust, loyalty and retention (Iqbal et al., 2018). Green banking should be adopted and practiced by the banking sector to fulfill the needs of sustainable development and facilitate individuals and businesses to overcome unforeseeable situations, including economic instability and other supply chain disruptions that economies have already experienced due to the pandemic Covid-19 (Lambrecht & Tucker, 2019).

Due to the continuous increase in population, poor waste management system, inefficient usage of technologies and poor resource management, Pakistan has faced multiple ecological and problems (Bukhari et al., 2020). State Bank of Pakistan (SBP) has adopted the term to promote eco-friendly operations going forward, which will help customers and banks minimize their carbon footprints. Various strategies and initiatives have been opted for by the banking sector to effectively minimize ecological inequality and encourage environmentally friendly businesses

(Bukhari et al., 2023). Considering international standards, SBP provided regulations for green banking in year 2017. The main aim of these regulations is associated to (a) development of green banking policy and frameworks; (B) banking sector's adoption and acceptance of green banking policy and encouragement of environmentally sociable businesses, and (c) Green banking approaches as a significant part of internal control framework and processes.

There are some studies in the literature that have discussed the concept of green banking (Aizawa & Yang, 2010); (Herath & Herath, 2019). A study has analyzed the profitability of banks in China after practicing green financing policy (Park & Kim, 2020). Few studies have discussed the implementation of credit policy considering the objective of wealth maximization (Oyegunle & Weber, 2015). Few studies explored the association among green banking and further practices, including renewable energy, on the environment (Z. Chen et al., 2022). Further, another work examined the influence of green banking in improving responsibilities of society and environment (Zhang et al., 2022). Effect of green banking in SDGs has also been discoursed in literature (Al Amin et al., 2023). However, concept of green banking is still considered novel and significant, which needs to be addressed extensively. Banks consider central pillars in environmentally friendly project financing and encourage green banking as the primary determinant of corporate social responsibility (CSR) (Aslam & Jawaid, 2022). A study by Aslam and Jawaid (2022) explained the association between CSR and green marketing. It is also suggested that green banking significantly influences brand image and trust, considering the banking sector as the central pillar of financing development and economic growth.

Further, implementing green banking practices is considered a noteworthy determinant of environmental sustainability, and findings by Kumar et al. (2022) have discussed the standing of green banking and associated sustainable growth determinants, considering the practices of commercial banks in India. Green banking has developed as a critical component in fostering sustainable development by integrating environmentally friendly practices into the financial sector. These practices include the adoption of energy-efficient technologies, paperless banking, and sustainable financing options, which align with the global agenda for environmental protection (Bukhari et al., 2019).

Moreover, Sharma and Choubey (2022) emphasize that green banking serves as a cornerstone in promoting social, environmental, economic, and corporate development, particularly in developing economies. By financing green projects such as renewable energy initiatives, waste management systems, and energy-efficient industries, green banking helps address critical environmental concerns. Simultaneously, it fosters economic growth by opening new avenues for investment and creating employment opportunities. From a corporate perspective, implementing green banking practices enhances a bank's reputation, strengthens its corporate social responsibility (CSR) profile, and attracts environmentally conscious customers and investors. Thus, green banking not only supports environmental sustainability but also contributes to broader developmental goals by fostering inclusive growth and sustainable business practices.

Green banking is an emerging and novel concept, and multiple initiatives have been adopted by the banking sector, including e-banking, digitalized systems, and paperless working environments, as contributions to the environment and society (Singh & Chakrapani, 2015). However, only some studies exist on green banking corporate policies, employee practices and customer-related initiatives. Significant work has been done on green banking, considering developed economies Weber (2016). In developing economies like Pakistan, green banking still has some uncovered perspectives that need to be discussed. To the best of our knowledge, no noteworthy study that specifically considers the banking industry in Pakistan based on the quantitative study has been identified in the literature that discusses the factors influencing the adoption of green banking practices. Considering the existing research gap, current research aims to determine factors that can affect the adoption of green banking practices in commercial banks in Pakistan. This study investigates the relationship between the adoption and associated determinants of green banking. Therefore, the main research question of the current study is "which factors influence the adoption of green banking practices in commercial banks in Pakistan"?

Based on the main research question, the following hypothesis has been designed in this study analysis:

H1: Economic factors significantly affect green banking adoption in Pakistan's commercial banks.

H2: Stakeholder pressure significantly affects green banking adoption in Pakistan's commercial banks.

H3: Loan demand significantly affects green banking adoption in Pakistan's commercial banks.

2. LITERATURE REVIEW

2.1. Theoretical Framework

In the current economic situation, every organization must consider environmental, social and other direct and indirect perspectives to be profitable and competitive. The organization has to consider stakeholder theory, institutional theory and legitimacy theory. Green banking practices are associated with all these theories, leading to sustainable development in Pakistan only through the assurance of stakeholder interest, institutional factors and legitimacy laws.

2.1.1. Stakeholder Theory

According to stakeholder theory, it is suggested that the survival and growth of an organization are linked with the satisfaction level of economic and non-economic factors, explicitly considering stakeholders' needs and interests. National and international authorities are typically considered part of the stakeholder group (Bose et al., 2018). These national and international authorities encourage companies to consider environmental and social perspectives significantly while making investment decisions (Gulzar et al., 2024). Organizations should consider investments in green projects, buildings, environmentally friendly projects, environmental management plans and resource management systems (Delgado-Márquez et al., 2017; Perrault & Clark, 2016). In this way, banks should focus on green financing products, considering the pressure and interest of stakeholders related to investment decisions and improve their reputation and trust among their customers.

2.1.2. Legitimacy Theory

According to legitimacy theory, a significant relationship exists between organization and society considering social values, norms and other social perspectives. Legitimacy theory also

assumes that organizations actively seek to maintain or repair their legitimacy through various strategies, such as CSR initiatives, transparent reporting, or community engagement programs. By doing so, they not only strengthen their social license to operate but also enhance their reputation and competitive edge in the market (Gray et al., 1996; Ntim et al., 2013). According to Bose et al. (2018), banks prefer to practice green banking policies and ensure the disclosure practices of green financing to minimize this gap between the organization and society.

2.1.3. Institutional Theory

Institutional theory suggests that all organization perform their operations in an institutional environment, considering social responsibilities by fulfilling social norms, values and laws (Oliver, 1991). The process of sharing information among society and individuals is called institutionalization. In other words, institutionalization refers to the arrangements of developed processes and learned frameworks within society and the organization (Dillard et al., 2004). Considering institutional perspectives, banks prefer to practice green banking policy and implement the concept of the green environment in society more efficiently. Institutional pressure makes Bankers more concerned about environmental sustainability (Ortiz Mandojana et al., 2016).

Further, banks prefer to adopt green banking practices due to other normative and coercive pressures (Berrone et al., 2013). Coercive pressures, including regulations and frameworks designed by regulatory authorities, encourage organizations to redesign their business structure. Ultimately, institutional pressures serve as a powerful catalyst, pushing banks to take a proactive role in promoting environmental sustainability. Organizations prefer to practice an environmental management framework due to the influence of government policies and social responsibilities implemented by other regulatory authorities (L. Chen et al., 2015). In this way, green banking regulations by SBP significantly influence commercial banks in Pakistan to practice institutional theory.

2.1.4. Social Contract Theory

The individual social relationship has been idealized as a symbiotic scenario in which two involved parties mutually agree to transfer their right to the state in order to ensure social order, which ultimately supports improved human well-being and social life along with other social

benefits and protection (Ellahi et al., 2021). Under the social contract theory, organizations are expected to align their operations with societal values and priorities. This includes addressing critical issues such as environmental sustainability, economic equity, community development, and ethical governance. By doing so, organizations gain public trust, legitimacy, and the "social license to operate," which are essential for their long-term growth and existence. Generally, organizations have been restricted by social contract whereby they agree to perform their activities considering the impact on society and their social responsibilities, which ultimately give assurance of their growth and existence (Choudhury et al., 2013).

2.2. Review of Empirical Research

Only some studies have discussed concept of green banking, associated challenges and its adoption and practices towards sustainable development. Green banking is considered a social responsibility associated with activities considering environmental protection first when considering financing projects. Before financing any project, the banks should consider project-associated environmental factors (Bihari, 2011). The ethical and social aspects should also be highlighted, and banks should facilitate only environmentally concerned organizations for project financing (Goyal & Joshi, 2011). Green banking is considered a banking system that can divert the attention of potential customers towards social banking rather than conventional banking. Green banking supports society and business operations by saving resources, including time, cost, etc. Green banking practices encourage a paperless, e-based environment and aware business activities to support social and environmental responsibilities (Bahl, 2012).

Multiple factors, including economic conditions, can influence green banking practices (Ahmad et al., 2013). Every financial institution should consider green banking policy and start working on green financing products, considering the interest of stakeholders and other social and environmental responsibilities to compete in the current working environment. (Choudhury et al., 2013). Various financing-associated risks, including reputational, legal, brand, and credit risks, can be mitigated through green banking practices (Dharwal & Agarwal, 2013). Further, studies have highlighted multiple green banking initiatives, including environmentally friendly project financing, minimizing carbon footprints, green financing products, green bonds, green buildings, and other environmentally friendly activities. Multiple advantages of green banking initiatives have been discussed by authors in literature studies, specifically industrialization reduction,

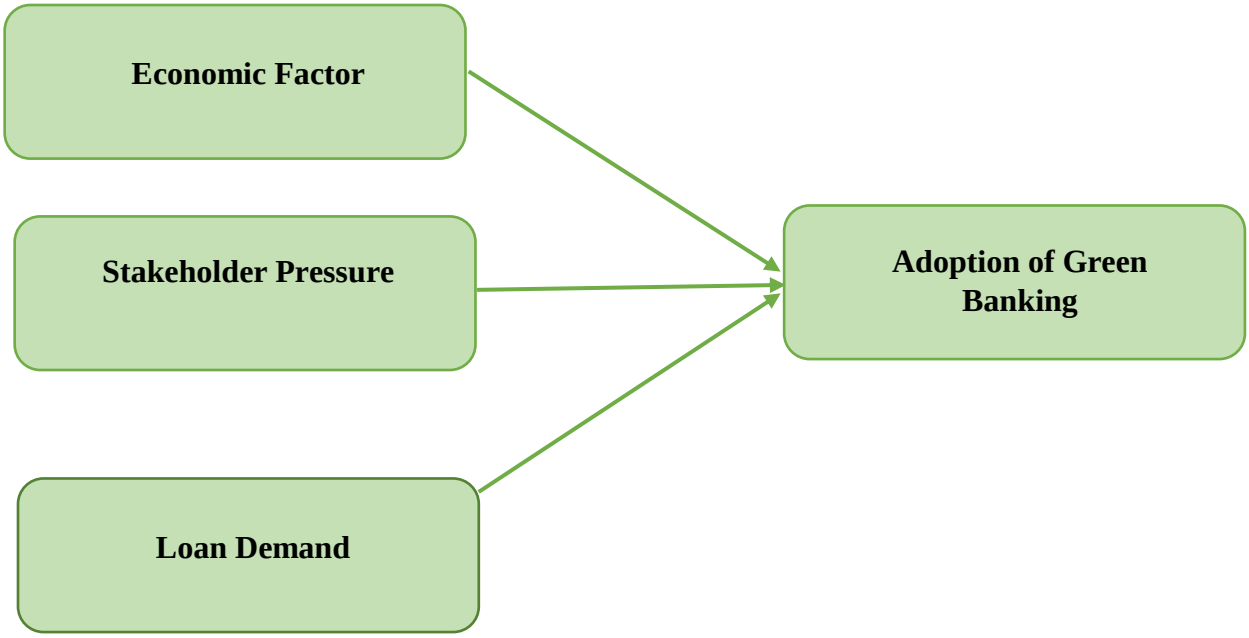
increased environmental awareness among customers, stakeholders, and employees, loans at lower pricing, and investment in environmentally friendly projects (Gray et al., 1996). A study by Ntim et al. (2013) highlighted the details of developing countries, including India, Pakistan, and Malaysia, as the worst polluted countries due to increased industrialization.

Bankers in developing countries should consider green banking initiatives and ecological perspectives as significant parts of financing policies, ultimately encouraging industries to invest in social and environmentally friendly projects (Chaurasia, 2014). Green banking initiatives such as e-commerce assure environmental sustainability through paperless business activities, electronic or online banking systems, and other digitalized daily banking activities (Hossen et al., 2014). Research has also been done on how green banking initiatives affect green trust and how green trust affects green loyalty (Argenti, 2017).

Pakistan is considered a polluted country due to industrialization around the world. Considering the current scenario, the green banking policy in Pakistan was introduced by the SBP in 2015 and instructed every bank to follow these guidelines and submit quarterly reports per the guided framework (Rahman & Rahman, 2020). The environmental condition of a country is considered the most sensitive perspective, specifically developing economies, which needs to be addressed worldwide (Mohammad Masukujjaman et al., 2016). SBP has provided guidelines on green banking, considering Global Reporting Initiative and standardized guiding principles related to reporting sustainability practices for developing and developed economies worldwide (Shaukat et al., 2024).

A study by (L. Chen et al., 2015) discussed the green banking approach and highlighted its significance in developing and implementing multiple green banking-related services and products. Continuous climate change is the most persistent concern that must be addressed globally. Pakistan is currently experiencing a vulnerable situation that must be changed to overcome any expected damages. It is recommended to encourage green banking practices through awareness, innovation, collaboration and other mitigation strategies (Yu et al., 2020). Therefore, the following conceptual framework (figure 1) is developed, based on the above discussion:

Figure 1 – Conceptual Framework



3. RESEARCH METHODOLOGY

3.1.Research Design

Them main objective of the current study is to investigate factors influencing the adoption of green banking initiatives in commercial banks in Pakistan. With the help of literature, a questionnaire has been developed to collect data and structure equation modeling used to investigate the study hypothesis. The questionnaire consists of two main categories: one is related to the adoption of green banking and the other is the factors that affect the adoption of green banking. The questionnaire related to factors is further grouped into three sections: economic factors, stakeholder pressure and loan demand. The questions of this questionnaire are designed on a Likert scale (1–5) where five are strongly disagreeing and one is strongly agreeing.

3.2.Data analysis technique

Current study used the structure equation modeling technique (SEM) for data analysis collected through a questionnaire. Structure equation modeling is appropriate to explain the initial evaluation of reliability and validity differences while estimating variables among the selected population (Raines-Eudy, 2000). In addition, the structure equation modeling technique is considered one of the efficient quantitative analyses that can be used to analyze the theoretical association that exists in structural models based on unobserved variables and can be investigated further as a measurement model or confirmatory factor analysis (Harerimana & Mtshali, 2020). Initially, the CFA model is used in this study, and after getting confirmation, structural equation modeling was tested.

3.3.Sampling and participants

The sample is considered the whole population's sub-part, and inferential statistics is used to generalize from the targeted population (Barzola-Quiquia et al., 2008). A convenient sampling technique has been used for sample selection among the total number of commercial banks in Pakistan. Data was gathered from the employees of banks placed at multiple line manager to senior manager levels in the commercial bank. The sample size of 50–100 is reasonable and recommended for significant results of structure equation modeling (I. Lee et al., 2011).

4. RESULTS AND DISCUSSION

4.1.Demographics analysis

The basic profile of respondents, including gender, education and experience, is mentioned in *Table 4.1*. Demographic analysis shows that around 83% of respondents are male, and the remaining 16.7% are female. Further, 15% of respondents have below 3 years of experience, 16.7% have 4-6 years of experience, 28.3% have 7-9 years of experience, 20% have 10–14 years, and 20% have 15 and above years of experience. Most respondents are graduates, with 78.3%.

Table 4.1: *Respondent's Profile*

		Frequency	Percent
Gender	Male	50	83.3%
	Female	10	16.7%
	Total	60	100%
Education	Undergraduate	11	18.3%
	Graduate	47	78.3%
	Port Graduate	1	1.7%
	Others	1	1.7%
	Total	60	100%
Experience	Below 3	9	15.0%
	4 to 6	10	16.7%
	7 to 9	17	28.3%
	10 to 14	12	20.0%
	15 and above	12	20.0%
	Total	60	100.0%

Source: Authors' own calculations

4.2.Confirmatory Factor Analysis

The findings of confirmatory factor analysis, multiple model fit indices and standardized coefficient values are used to investigate the measurement model of the research (Pisharodi & Parameswaran, 1992). In order to analyze the reliability and validity of study data, Cronbach's Alpha and Composite Reliability have been examined, as mentioned in *Table 4.2.* The values of

Cronbach's Alpha range from 0.73 to 0.821, which is appropriate as values are more significant than 0.70 (Doi et al., 2000). In addition, the values of Composite Reliability fall from 0.754 to 0.824, which indicates that all values are above the cut-off criteria value, which is 0.7 (Forza, 2002). The values of the average variance extracted are also greater than 0.5, which is appropriate as per the suggested criteria (Alarcón et al., 2015). Considering the values of Cronbach's Alpha and Composite Reliability, it is suggested that the constructs' validity is appropriate and internal consistency of estimating items is acceptable.

Table 4.2: *Internal/Composite Reliability*

Items	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AGB	0.791	0.814	0.857	0.55
EC	0.73	0.754	0.826	0.544
L	0.821	0.824	0.87	0.529
S	0.77	0.789	0.846	0.528

Source: Authors' own calculations

Table 4.3 presents the calculations of factor loadings used to estimate the convergent validity and reliability of the model. The values of factor loading for the survey items range between 0.582 and 0.824, which indicates that all factor loadings are greater than the cut-off criteria, which is 0.5 (Hair et al., 2011). Overall, the convergent validity of estimating survey items seems satisfactory and appropriate.

Table 4.3: *Factor loading of Survey Items*

Construct	Items	Factor Loading
Adoption of Green Banking	AGB1	0.764
	AGB2	0.542
	AGB3	0.765
	AGB4	0.851
	AGB5	0.751

	EC1	0.795
Economic Factor	EC2	0.691
	EC3	0.712
	EC4	0.748
	L1	0.679
	L2	0.824
Loan Demand	L3	0.722
	L4	0.702
	L5	0.7
	L6	0.727
	S1	0.587
Stakeholder Pressure	S2	0.774
	S3	0.614
	S4	0.807
	S5	0.816

Source: Authors' own calculations

Moreover, discriminant validity has also been investigated, considering the estimation of both the Fornell–Larcker criteria and the Heterotrait–Monotraits ratio (HTMT). In order to estimate the discriminant validity, the value of the square root of the average variance extracted should be greater than the highest correlation of any estimating construct of the study model, as Ab Hamid et al. (2017) suggested. The findings of the Fornell–Larcker criteria are mentioned in *Table 4.4*, which indicate that every AVE value is greater than the square inter-factor correlated value. It implies that all the constructs have satisfactory discriminant validity in this study.

Table 4.4: *The Fornell-Larcker Criterion*

	AGB	**EC**	**L**	**S**
AG	0.742			
EC	0.643	0.737		
L	0.700	0.512	0.727	
S	0.78	0.561	0.584	0.726

Source: Authors' own calculations

Considering the significance of HTMT over Fornell-Larcker criteria, this study also tested HTMT as mentioned in *Table 4.5*, and all values are less than 0.9, which assures that there is no possibility of validity problem existence in this study data (Ali et al., 2018). To conclude, these findings indicate the existence of discriminant validity at a satisfactory level among the selected factors of this study model.

Table 4.5: *Heterotrait–Monotraits ratio (HTMT)*

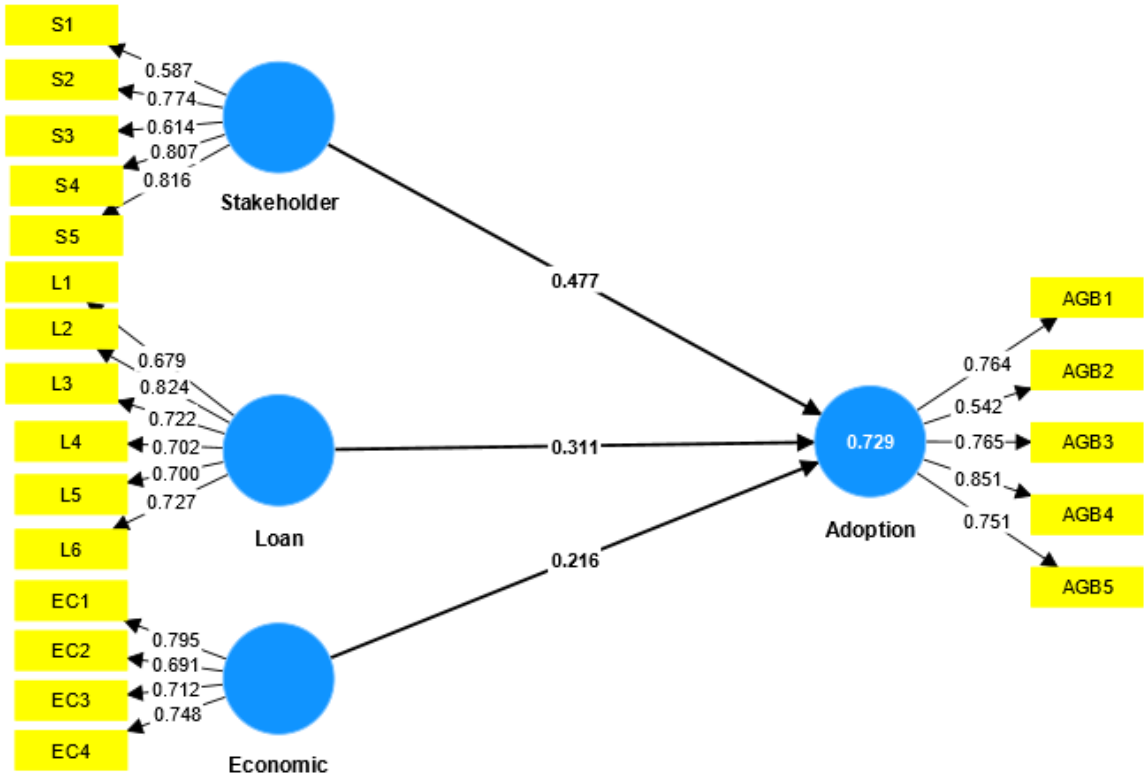
	AGB	EC	Loan	Stake
AGB				
EC	0.821			
Loan	0.836	0.624		
Stake	0.817	0.708	0.718	

Source: Authors' own calculations

4.3.Structural Equation Modeling

The findings of the structure equation model of this study are presented in *Figure 2*, which indicates a relationship between the selected independent and dependent variables. It is indicated that Economic factors, Stakeholder pressure and loan demand significantly influence the adoption of green banking practices in commercial banks of Pakistan.

Figure 2 : *Estimates of Structural Equation Model*



Source: Authors' own calculations

Table 4.6 presents the findings of the tested hypothesis, which indicate that all study hypotheses are accepted. Stakeholder pressure, economic factors and loan demand significantly affect the adoption of green banking practices in banks in Pakistan. Economic reasons, loan demand and stakeholder pressure play a significant and critical role in realizing and accepting green banking practices of commercial banks in Pakistan and thereby encourage the idea of sustainable economic development of the country.

Table 4.6: *PLS Results*

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Economic -> Adoption	0.216	0.218	0.088	2.44	0.005
Loan -> Adoption	0.311	0.313	0.107	2.913	0.004
Stakeholder -> Adoption	0.477	0.476	0.082	5.848	0.000

Source: Authors' own calculations

5. Conclusion

Being agents of sustainability development, the role of banks is significant in adopting green banking initiatives and encouraging businesses to work on sustainable development models (Nguyen et al., 2023). All central commercial banks in Pakistan have recently extensively practiced and adopted green banking initiatives. Current study highlights factors affecting the adoption of green banking in commercial banks of Pakistan. These banks have started the practices of green banking in order to achieve sustainable development goals by 2030 by supporting those projects that are environmentally friendly. In this way, green banking is considered as the way forward towards future sustainability.

According to the current study's findings, economic considerations, loan demand, and stakeholder pressure are important and crucial in helping Pakistani commercial banks adopt green banking practices and thereby support the notion of the nation's sustainable economic growth. Adopting green banking practices has multiple benefits for commercial banks rather than only encouraging environmentally friendly activities, including cost reduction, risk mitigations, enhanced brand standing, increased client trust and high customer retention. The commercial banks of Pakistan need to realize their ESG responsibilities and actively participate in the global competitive market.

5.1. Theoretical Contribution

To the best of our knowledge, the factors influencing the adoption of green banking practices, particularly in emerging nations, have not been extensively studied in the literature. In Pakistan, green banking still has some uncovered perspectives that need to be discussed. This study explores the current significant factors affecting the adoption of green banking among the employees of commercial banks in Pakistan to fill the existing research gap and update literature studies for the future. Moreover, a quantitative study has yet to be conducted at an extensive level considering green banking perspectives. In this way, this study provides a validation to use quantitative research to analyze green banking initiatives adoption and other affecting determinants in commercial banks of Pakistan. This study extends the literature by assessing the practices of line managers and senior managers inside the commercial banks of Pakistan, which are currently practicing and adopting green banking and dealing with the associated challenges. It is clearly stated that through the implementation of green banking practices, environmental concerns will no longer be problematic. New opportunities can be introduced through an efficient resource management system, which will help the bankers retain and build trust among customers and complement their reputation in the competitive market. This will also encourage banks to practice corporate social responsibility as the significant perspective of green banking and can use their internal framework to create stakeholder awareness. This study is helpful and significant for policymakers, governments, regulatory authorities, environmentalists and stakeholders while developing and implementing green banking strategies.

5.2. Study Limitations and Future Recommendations

This study has discussed the concept of green banking by explicitly considering the banking sector of Pakistan, a single developing country. Future study is recommended to go to the broader context of the region and perform across-country analysis. Further, this study has focused only on commercial banks of Pakistan and excludes other financial institutions such as microfinance. It is also recommended to practice the research considering all financial institutions. This study has opted for a questionnaire as a data collection method. Other data sources such as participant observation, interviews, and document analysis are also suggested. This study has investigated the factors affecting the adoption of green banking, considering only bankers' perspectives. However, other stakeholders, including customers, regulators and

employee perspectives, can be discussed in future studies. For this study, only bank practitioners, line managers, and senior managers have been targeted as participants. Anyhow, future study is recommended considering the perspective of primary practitioners and actual policy developers.

REFERENCES

Ab Hamid, M., Sami, W., & Sidek, M. M. (2017). *Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion.* Paper presented at the Journal of Physics: Conference Series.

Ahmad, F., Zayed, N. M., & Harun, M. A. (2013). Factors behind the adoption of green banking by Bangladeshi commercial banks. *ASA University Review, 7*(2).

Aizawa, M., & Yang, C. (2010). Green credit, green stimulus, green revolution? China's mobilization of banks for environmental cleanup. *The Journal of Environment & Development, 19*(2),119-144.

Al Amin, M., Ahad Mia, M. A., Bala, T., Iqbal, M. M., & Alam, M. S. (2023). Green finance continuance behavior: the role of satisfaction, social supports, environmental consciousness, green bank marketing initiatives and psychological reactance. *Management of Environmental Quality: An International Journal*.

Alarcón, D., Sánchez, J. A., & De Olavide, U. (2015). *Assessing convergent and discriminant validity in the ADHD-R IV rating scale: User-written commands for Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait ratio of correlations (HTMT).* Paper presented at the Spanish STATA meeting.

Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International journal of contemporary hospitality management, 30*(1),514-538.

Argenti, P. A. (2017). Strategic communication in the c-suite. *International Journal of Business Communication, 54*(2),146-160.

Aslam, W., & Jawaid, S. T. (2022). Green banking adoption practices: Improving environmental, financial, and operational performance. *International Journal of Ethics and Systems*.

Bahl, S. (2012). The role of green banking in sustainable growth. *International Journal of Marketing, Financial Services and Management Research, 1*(2),27-35.

Barua, S. (2020). *Principles of green banking: Managing environmental risk and sustainability*: Walter de Gruyter GmbH & Co KG.

Barzola-Quiquia, J., Yao, J. L., Rödiger, P., Schindler, K., & Esquinazi, P. (2008). Sample size effects on the transport characteristics of mesoscopic graphite samples. *physica status solidi (a), 205*(12),2924-2933.

Berrone, P., Fosfuri, A., Gelabert, L., & Gomez-Mejia, L. R. (2013). Necessity as the mother of 'green'inventions: Institutional pressures and environmental innovations. *Strategic management journal, 34*(8),891-909.

Bihari, S. C. (2011). Green banking–socially responsible banking in India. *The India Banker, 6*(1),32-37.

Bose, S., Khan, H. Z., Rashid, A., & Islam, S. (2018). What drives green banking disclosure? An institutional and corporate governance perspective. *Asia Pacific Journal of Management, 35*,501-527.

Bukhari, S. A. A., Hashim, F., & Amran, A. (2019). Determinants of green banking adoption: a theoretical framework. *KnE Social Sciences*,1–14-11–14.

Bukhari, S. A. A., Hashim, F., & Amran, A. (2020). Green Banking: a road map for adoption. *International Journal of Ethics and Systems, 36*(3),371-385.

Bukhari, S. A. A., Hashim, F., & Amran, A. (2023). Green banking: a strategy for attainment of UN-Sustainable Development Goals 2030. *International Journal of Environment and Sustainable Development, 22*(1),13-31.

Chaurasia, A. K. (2014). Green banking practices in Indian banks. *The Journal of Management and Social Science, 1*(1),41-54.

Chen, H., Chen, Q., & Gerlach, S. (2013). The implementation of monetary policy in China: The interbank market and bank lending. In *Global banking, financial markets and crises* (pp. 31-69): Emerald Group Publishing Limited.

Chen, L., Tang, O., & Feldmann, A. (2015). Applying GRI reports for the investigation of environmental management practices and company performance in Sweden, China and India. *Journal of Cleaner Production, 98*,36-46.

Chen, Z., Mirza, N., Huang, L., & Umar, M. (2022). Green banking—can financial institutions support green recovery? *Economic Analysis and Policy, 75*,389-395.

Choudhury, T. T., Salim, M., Al Bashir, M. M., & Saha, P. (2013). Influence of stakeholders in developing green banking products in Bangladesh. *Research Journal of Finance and Accounting*,67-77.

Delgado-Márquez, B. L., Pedauga, L. E., & Cordón-Pozo, E. (2017). Industries regulation and firm environmental disclosure: A stakeholders' perspective on the importance of legitimation and international activities. *Organization & Environment, 30*(2),103-121.

Dharwal, M., & Agarwal, A. (2013). Green banking: An innovative initiative for sustainable development. *ACCMAN Institute of Management Article, 2*(3),1-7.

Dillard, J. F., Rigsby, J. T., & Goodman, C. (2004). The making and remaking of organization context: duality and the institutionalization process. *Accounting, Auditing & Accountability Journal, 17*(4),506-542.

Doi, Y., Minowa, M., Uchiyama, M., Okawa, M., Kim, K., Shibui, K., & Kamei, Y. (2000). Psychometric assessment of subjective sleep quality using the Japanese version of the Pittsburgh Sleep Quality Index (PSQI-J) in psychiatric disordered and control subjects. *Psychiatry research, 97*(2-3),165-172.

Ellahi, A., Jillani, H., & Zahid, H. (2021). Customer awareness on Green banking practices. *Journal of Sustainable Finance & Investment*,1-17.

Forza, C. (2002). Survey research in operations management: a process-based perspective. *International journal of operations & production management, 22*(2),152-194.

Goyal, K., & Joshi, V. (2011). A study of social and ethical issues in banking industry. *International Journal of Economics and Research, 2*(5),49-57.

Gray, R., Owen, D., & Adams, C. (1996). *Accounting & accountability: changes and challenges in corporate social and environmental reporting*: Prentice hall.

Gulzar, S., Sarwar, U., Sattar, S., Usman, M., & Quibtia, M. (2024). Tax Audit, Tax Penalty, Religiosity and Tax Compliance.*Journal of Asian Development Studies*, *13*(3), 776-79

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2),139-152.

Harerimana, A., & Mtshali, N. G. (2020). Using Exploratory and Confirmatory Factor Analysis to understand the role of technology in nursing education. *Nurse Education Today, 92*,104490.

Herath, H., & Herath, H. (2019). Impact of Green banking initiatives on customer satisfaction: A conceptual model of customer satisfaction on green banking. *Journal of Business and Management, 1*(21),24-35.

Hossen, M. M., Uddin, M. N., & Hossain, A. (2014). E-commerce: A scrutiny about upgrading environmental commerce through securing environmental sustainability. *Bup Journal, 1*(2),83-103.

Iqbal, M., Nisha, N., Rifat, A., & Panda, P. (2018). Exploring client perceptions and intentions in emerging economies: The case of green banking technology. *International Journal of Asian Business and Information Management (IJABIM), 9*(3),14-34.

Kumar, K., Sharma, H., Khan, W., & Kumar, R. (2022). Factors influencing adoption of green banking practices: Evidence from commercial banks in India. *Journal of Asia Entrepreneurship and Sustainability, 18*(1),41-57.

Lambrecht, A., & Tucker, C. (2019). Algorithmic bias? An empirical study of apparent gender-based discrimination in the display of STEM career ads. *Management science, 65*(7),2966-2981.

Lee, H. W. (2011). An Application of Latent Variable Structural Equation Modeling for Experimental Research in Educational Technology. *Turkish Online Journal of Educational Technology-TOJET, 10*(1),15-23.

Lee, I., Choi, K., & Zhao, L. (2011). Sampling-based RBDO using the stochastic sensitivity analysis and dynamic Kriging method. *Structural and Multidisciplinary Optimization, 44*,299-317.

Masukujjaman, M., & Aktar, S. (2013). Green banking in Bangladesh: A commitment towards the global initiatives. *Journal of Business and Technology (Dhaka), 8*(1-2),17-40.

Masukujjaman, M., Siwar, C., Mahmud, M. R., & Alam, S. S. (2016). Bankers' perception of Green Banking: Learning from the experience of Islamic banks in Bangladesh. *Geografia, 12*(2).

Nanda, S., & Bihari, S. C. (2012). Profitability in banks of India: an impact study of implementation of green banking. *International Journal of Green Economics*, *6*(3),217-225.

Nath, B., Chaudhuri, P., & Birch, G. (2014). Assessment of biotic response to heavy metal contamination in Avicennia marina mangrove ecosystems in Sydney Estuary, Australia. *Ecotoxicology and Environmental Safety*, *107*,284-290.

Nguyen, A. H., Hoang, T. G., Nguyen, D. T., Nguyen, L. Q. T., & Doan, D. T. (2023). The development of green bond in developing countries: insights from Southeast Asia market participants. *The European Journal of Development Research, 35*(1),196-218.

Ntim, C. G., Lindop, S., & Thomas, D. A. (2013). Corporate governance and risk reporting in South Africa: A study of corporate risk disclosures in the pre-and post-2007/2008 global financial crisis periods. *International Review of Financial Analysis, 30*,363-383.

Oliver, C. (1991). Strategic responses to institutional processes. *Academy of management review, 16*(1),145-179.

Ortiz Mandojana, N., Aguilera Caracuel, J., & Morales Raya, M. (2016). Corporate governance and environmental sustainability: The moderating role of the national institutional context. *Corporate Social Responsibility and Environmental Management, 23*(3),150-164.

Oyegunle, A., & Weber, O. (2015). Development of sustainability and green banking regulations: existing codes and practices.

Park, H., & Kim, J. D. (2020). Transition towards green banking: role of financial regulators and financial institutions. *Asian Journal of Sustainability and Social Responsibility, 5*(1),1-25.

Perrault, E., & Clark, C. (2016). Environmental shareholder activism: Considering status and reputation in firm responsiveness. *Organization & Environment, 29*(2),194-211.

Pisharodi, R. M., & Parameswaran, R. (1992). Confirmatory factor analysis of a country-of-origin scale: initial results. *ACR North American Advances*.

Porter, M. E., & Kramer, M. R. (2014). A response to Andrew Crane et al.'s article. *California Management Review, 56*(2),149-151.

Rahman, M. M., & Rahman, M. S. (2020). Green reporting as a tool of environmental sustainability: some observations in the context of Bangladesh. *Int. J. Manag. Account, 2*(2),31-37.

Raines-Eudy, R. (2000). Using structural equation modeling to test for differential reliability and validity: An empirical demonstration. *Structural equation modeling, 7*(1),124-141.

Rehman, A., Ullah, I., Afridi, F.-e.-A., Ullah, Z., Zeeshan, M., Hussain, A., & Rahman, H. U. (2021). Adoption of green banking practices and environmental performance in Pakistan: A

demonstration of structural equation modelling. *Environment, Development and Sustainability*,1-21.

Sachs, J., Woo, W. T., & Taghizadeh-Hesary, F. (2019). Handbook of green finance: Energy security and sustainable development. *(No Title)*.

Sardana, S. (2021). A Conceptual Study of Green Financing in Promoting Sustainable Development. *Envision Journal of Commerce Department of ACFA, 15*.

Sarwar, U., Bint-e-Naeem, N., Fahmeed, L., & Atif, M. (2024). Role of Perceived Security and Financial Attitude in Shaping Behavioral Intention under the Moderation of Financial Literacy. *Journal of Asian Development Studies, 13*(3), 1380-1395

Sharma, M., & Choubey, A. (2022). Green banking initiatives: a qualitative study on Indian banking sector. *Environment, Development and Sustainability, 24*(1),293-319.

Shaukat, M. Z., Yousaf, S. U., Sarwar, U., & Sattar, S. (2024). Thriving in Turmoil: Unraveling the Interplay of Resources, Resilience, and Performance among SMEs in Times of Economic Vulnerability. *Bulletin of Business and Economics (BBE), 13*(2), 164-173.

Singh, N., & Chakrapani, G. J. (2015). ANN modelling of sediment concentration in the dynamic glacial environment of Gangotri in Himalaya. *Environmental monitoring and assessment, 187*,1-14.

Weber, O. (2016). The impact of green banking guidelines on the sustainability performance of banks: the Chinese case.

Yu, W., Chavez, R., Feng, M., Wong, C. Y., & Fynes, B. (2020). Green human resource management and environmental cooperation: An ability-motivation-opportunity and contingency perspective. *international journal of production Economics, 219*,224-235.

Zhang, X., Wang, Z., Zhong, X., Yang, S., & Siddik, A. B. (2022). Do green banking activities improve the banks' environmental performance? The mediating effect of green financing. *Sustainability, 14*(2),989.

Zhixia, C., Hossen, M. M., Muzafary, S. S., & Begum, M. (2018). Green banking for environmental sustainability-present status and future agenda: Experience from Bangladesh. *Asian Economic and Financial Review, 8*(5),571-585.