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**The Impact of Sustainable Finance on Financial Risk Management of
Conventional Banks in Pakistan**



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Abstract

⁹⁸ This study examines the impact of sustainable finance on financial risk management in conventional banks in Pakistan. Utilizing a comprehensive methodological framework, the research explores how integrating environmental, social, and governance (ESG) criteria can influence operational, credit, market, and liquidity risks. Empirical data collected from various banks over multiple years were analyzed using panel data regression models. The results indicate that sustainable finance significantly reduce financial risks, enhance transparency, and improve overall financial performance. These findings highlight the strategic value of ESG integration for risk mitigation and long-term stability in the banking sector, providing practical recommendations for banks and policymakers to advance sustainable finance in emerging markets.

Keywords: Sustainable Finance, Financial Risk Management, ESG Criteria, Conventional Banks, Pakistan, Operational Risk, ¹¹⁶ Credit Risk, Market Risk, Liquidity Risk.

Acknowledgment

The process of curating this research paper has been a long and fulfilling journey, marked by both enjoyment and challenges. It has allowed me to delve deeply into the field of sustainable finance and its impact on financial risk management, a topic that has intrigued me for a considerable time. While the journey was demanding, it also provided me with an invaluable opportunity to expand my knowledge and understanding of this critical area.

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Dedication

To My Beloved Parents, they have always encouraged me and supported me they are my superpower.

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INTRODUCTION

1.1. Background of the Study

Conventional banks are the lifeblood of Pakistan's economy (Husain, 2009). They act as financial intermediaries, channeling savings towards productive investments that fuel growth (Husain, 2009). By extending credit to individuals and businesses, banks enable expansion and innovation (Hanif & Iqbal, 2010). Furthermore, they facilitate international trade through trade finance instruments, smoothing the path for export and import activities (SBP, 2022).

Sustainable finance has emerged as a crucial area of focus within the financial sector, driven by the increasing need to incorporate environmental, social, and governance (ESG) criteria into financial decision-making processes. This paradigm shift aims to foster sustainable economic growth, mitigate risks, and ensure long-term financial stability. Sustainable finance encompasses a variety of financial products and services designed to support sustainable development, including green bonds, social bonds, and impact investing. These instruments not only provide financial returns but also promote positive environmental and social outcomes, aligning financial activities with broader sustainability goals.

In recent years, the concept of sustainable finance has gained significant traction globally, prompting financial institutions to integrate ESG criteria into their operations. This integration is seen as a vital step toward addressing climate change, promoting social equity, and ensuring corporate governance practices that are ethical and transparent. Financial institutions that adopt sustainable finance are better positioned to manage risks associated with environmental and social factors, such as regulatory changes, climate-related disasters, and reputational risks.

Pakistan, like many developing countries, is increasingly recognizing the importance of sustainable finance. The banking sector in Pakistan plays a pivotal role in the country's economy, contributing substantially to GDP and overall financial stability. With the growing global emphasis on sustainability, Pakistani banks are beginning to adopt sustainable finance to align with international standards and enhance their risk management frameworks. This adoption is

driven by several factors, including regulatory pressures, investor demands, and the need to remain competitive in an evolving financial landscape.

Despite the increasing adoption of sustainable finance, empirical evidence on their impact on financial risk management within conventional banks in Pakistan remains limited. Financial risk management is a critical function within banks, involving the identification, assessment, and mitigation of risks that could adversely affect financial performance. These risks include operational risk, credit risk, and financial risk, each of which can have significant implications for the stability and profitability of financial institutions.

Operational risk refers to the potential losses resulting from inadequate or failed internal processes, systems, or external events. Sustainable finance can help mitigate operational risk by promoting robust governance structures and ethical business practices. Credit risk, on the other hand, pertains to the possibility of a borrower defaulting on their obligations, leading to financial losses for the bank. Integrating ESG criteria into credit assessment processes can enhance the quality of credit portfolios by identifying and managing environmental and social risks associated with borrowers. Financial risk, which encompasses market risk, liquidity risk, and interest rate risk, can also be influenced by sustainable finance through better asset-liability management and investment in sustainable assets that offer stable returns.

This study aims to fill the existing research gap by comprehensively examining the impact of sustainable finance on financial risk management in conventional banks in Pakistan. By exploring how sustainable finance influence operational risk, credit risk, and financial risk, the study seeks to provide valuable insights for banking institutions and policymakers. Understanding these dynamics is crucial for developing effective risk management frameworks that not only enhance financial stability but also contribute to sustainable economic development.

The findings of this study are expected to offer practical recommendations for conventional banks in Pakistan on integrating sustainable finance into their risk management strategies. These recommendations will be based on empirical evidence, ensuring that they are relevant and actionable. Moreover, the study will contribute to the broader literature on sustainable finance by providing insights specific to the Pakistani banking context, which can inform future research and policy development in other emerging market.

1.2. Problem Statement

Conventional banks in Pakistan are facing increasing pressure to incorporate sustainable finance due to growing global emphasis on environmental, social, and governance (ESG) criteria. Despite this, there is a significant gap in empirical research regarding the impact of sustainable finance on financial risk management in these banks. The specific effects of sustainable finance on managing operational risk, credit risk, and financial risk remain unclear, limiting the ability of banks to fully leverage these practices to enhance financial stability (Raza, Ali, & Mehboob, 2021).

Understanding whether sustainable finance contribute to improved financial risk management is crucial. If these practices are found to have no significant impact, it would suggest that banks might not need to prioritize them solely for risk management purposes, potentially saving resources that could be allocated elsewhere. Conversely, if sustainable finance is shown to significantly mitigate financial risks, it could lead to more robust risk management frameworks and promote long-term economic sustainability (Akhtar, Ullah, & Khan, 2020).

Therefore, this study seeks to address this gap by thoroughly analysing how sustainable finance influence financial risk management in conventional banks in Pakistan. By utilizing both quantitative and qualitative methods, the study aims to provide comprehensive insights that will be valuable for banking institutions and policymakers, ultimately offering practical recommendations to enhance risk management and promote sustainable finance (Ahmed, Naqvi, & Ikram, 2020).

1.3. Research Objectives

Objectives:

1. To examine the impact of sustainable finance on financial risk management in conventional banks in Pakistan.
2. To analyze how sustainable finance influence operational risk in conventional banks

in Pakistan.

3. To evaluate the effect of sustainable finance on credit risk in conventional banks in Pakistan.
4. To assess the impact of sustainable finance on market risk in conventional banks in Pakistan.
5. To determine the influence of sustainable finance on liquidity risk in conventional banks in Pakistan.

1.4. Research Questions

To be more specific, this research works to address and provide an answer to the following questions:

1. Does sustainable finance have an impact on financial risk management in conventional banks in Pakistan?
2. Do sustainable finance influence operational risk in conventional banks in Pakistan?
3. Do sustainable finance influence credit risk in conventional banks in Pakistan?
4. Does sustainable finance affect market risk in conventional banks in Pakistan?
5. Does sustainable finance have an impact on liquidity risk in conventional banks in Pakistan?

1.5. Research Gap

Despite the increasing global emphasis on sustainable finance and its potential benefits, there are several distinct gaps in empirical research specifically examining its impact on financial risk management within conventional banks in Pakistan. These gaps can be categorized into theoretical, empirical, and contextual gaps.

1.5.1. Theoretical Gap

The theoretical frameworks underlying sustainable finance, particularly in relation to financial risk management, have been well-developed in the context of developed

economies. Extensive research has been conducted to explore how sustainable finance, including the integration of environmental, social, and governance (ESG) criteria, can mitigate various financial risks and enhance the overall stability of financial institutions. However, there is a significant lack of theoretical exploration in the context of emerging markets like Pakistan. Emerging markets have unique economic, regulatory, and cultural characteristics that differentiate them from developed economies. The Resource-Based Theory (RBT), which posits that firms can gain and sustain competitive advantage through the strategic use of their internal resources, has not been thoroughly examined in the context of sustainable finance within Pakistani banks. This theoretical gap limits our understanding of how sustainable finance can be strategically leveraged to enhance financial risk management in this specific context. Addressing this gap requires a comprehensive theoretical framework that incorporates the unique attributes of emerging markets, enabling a better understanding of how sustainable finance can be adapted and optimized for financial risk management in Pakistan (Ahmed, 2023; Khan, 2023).

1.5.2. Empirical Gap

Empirical studies on the impact of sustainable finance on financial risk management are predominantly focused on developed markets. These studies have provided valuable insights into how ESG integration can enhance risk management, improve financial performance, and contribute to the stability of financial institutions. However, there is a scarcity of empirical evidence from emerging markets, particularly Pakistan. The existing empirical research often overlooks the specific challenges and opportunities presented by the unique economic, regulatory, and cultural landscape of Pakistan. For instance, the regulatory environment in Pakistan may differ significantly from that of developed countries, influencing the implementation and effectiveness of sustainable finance. Additionally, the cultural attitudes towards sustainability and corporate responsibility may vary, affecting how these practices are perceived and adopted by financial institutions. This empirical gap hinders the generalizability of findings from developed markets to the Pakistani context. Therefore, there is a pressing need for empirical studies that focus on Pakistan, providing insights into how sustainable finance impact financial risk management within its unique setting. Such studies would help bridge the gap between theory and

practice, offering evidence-based recommendations for policymakers and financial institutions in Pakistan (Raza, Ali, & Mehboob, 2023; Farooq & Nawaz, 2023).

1.5.3. Contextual Gap

The contextual relevance of sustainable finance varies significantly across different regions. While the benefits of ESG integration in risk management have been extensively documented in Western countries, there is limited research on how these practices are perceived, adopted, and effective within the Pakistani banking sector. The economic, regulatory, and cultural environment in Pakistan presents distinct challenges and opportunities that can influence the implementation and outcomes of sustainable finance. For example, the level of regulatory support for sustainable finance, the availability of green financial products, and the overall awareness and acceptance of ESG principles among stakeholders can vary widely between Pakistan and developed countries. The contextual gap highlights the need for region-specific studies to understand the local dynamics and tailor sustainable finance accordingly. By examining the specific conditions and factors that affect the adoption and effectiveness of sustainable finance in Pakistan, researchers can provide more relevant and actionable insights for local financial institutions. This, in turn, can help enhance the effectiveness of sustainable finance in managing financial risks and promoting long-term stability within the Pakistani banking sector (Khan & Shah, 2023; Zafar, Ahmed, & Hussain, 2023).

97 1.6. Significance Of the Study

The findings of this study will provide significant contributions at both the industry level and in practical and theoretical contexts. For the banking industry, understanding the impact of sustainable finance on financial risk management can lead to systemic improvements. By integrating environmental, social, and governance (ESG) criteria into financial decision-making, banks can enhance their risk mitigation strategies, leading to a more resilient and stable financial sector. Sustainable finance can help banks better manage risks related to environmental and social factors, such as climate change and regulatory

shifts, thereby safeguarding financial stability and promoting sustainable economic growth.

For banking institutions, this study offers practical insights into how sustainable finance can be used as a tool to improve risk management frameworks. Enhanced transparency and improved stakeholder trust are likely outcomes when banks adopt sustainable finance. These practices can lead to more effective management of operational, credit, and financial risks, resulting in stronger financial performance and long-term stability. Additionally, the study's findings can guide banks in aligning their operations with global sustainability standards, thereby enhancing their reputation and competitive edge in the market.

This study will also make significant theoretical contributions by filling the research gap on sustainable finance in the context of Pakistani banks. It will expand the existing literature by providing empirical evidence on how sustainable finance influence financial risk management in an emerging market. This research will contribute to the broader academic discourse on sustainable finance, offering new insights and validating theories within the context of developing economies. Furthermore, the study will serve as a foundation for future research, encouraging further exploration into the impacts of sustainable finance in other emerging markets.

1.7. Research Contribution

This study will make several important contributions in terms of addressing research gaps, providing empirical evidence, and advancing theoretical understanding. The study addresses a significant gap in the existing literature by examining the impact of sustainable finance on financial risk management within the context of conventional banks in Pakistan. While there is substantial research on sustainable finance in developed economies, studies focusing on emerging markets like Pakistan are relatively scarce. By exploring this under-researched area, the study will provide insights into how sustainable finance can be integrated into risk management frameworks in a developing country context.

The empirical contribution of this study lies in its comprehensive analysis of how sustainable finance influence various types of financial risks, including operational risk,

credit risk, and financial risk. Utilizing both quantitative and qualitative methods, the study will generate robust empirical data that offers practical insights for banking institutions. This evidence-based approach will help banks develop more effective risk management strategies and promote the adoption of sustainable finance, ultimately enhancing their financial stability and performance.

Theoretically, this study will expand the existing body of knowledge by validating and extending theories related to sustainable finance and financial risk management in the context of Pakistani banks. It will contribute to the broader academic discourse on sustainable finance by providing empirical evidence from an emerging market, which can inform future research and theory development. Additionally, the study will apply and test the resource-based view (RBV) theory within the framework of sustainable finance, offering new perspectives on how internal resources can be leveraged to achieve sustainable competitive advantage and improved risk management.

CHAPTER 2¹⁵

Literature Review

2.1. Sustainable Finance

Sustainable finance is an evolving field that integrates environmental, social, and governance (ESG) criteria into financial decision-making processes to promote long-term sustainable development. This concept has gained significant traction globally, as financial institutions and investors recognize the importance of addressing sustainability issues to mitigate risks and enhance financial performance. Sustainable finance encompasses a wide range of financial products and services, including green bonds, social bonds, impact investing, and ESG-integrated portfolios. The growing emphasis on sustainable finance reflects a broader shift towards more responsible and ethical financial practices.

2.1.1. Theoretical Perspectives

Several theoretical frameworks underpin the concept of sustainable finance. The Resource-Based View (RBV) theory posits that organizations can achieve competitive advantage by leveraging their unique internal resources, including sustainable practices (Barney, 1991; Hart, 1995). The Stakeholder Theory emphasizes the importance of addressing the interests of all stakeholders, including shareholders, employees, customers, and the community, to achieve long-term success (Freeman, 1984). These theories highlight the strategic value of integrating ESG criteria into financial decision-making, as it can enhance organizational resilience and reputation.

2.1.2. Global Context

Empirical research has demonstrated the positive impact of sustainable finance on financial performance and risk management in various contexts. A study by Friede, Busch, and Bassen (2015) conducted a meta-analysis of over 2,000 empirical studies and found that the majority reported a positive relationship between ESG criteria and corporate financial performance. This finding underscores the financial benefits of incorporating sustainability into

investment strategies. Another study by Hachenberg and Schiereck (2018) found that green bonds tend to exhibit lower yield spreads compared to conventional bonds, indicating lower perceived risk by investors.

2.1.3. Developing Economies

In the context of developing economies, the adoption of sustainable finance has been slower but is gaining momentum. A study by Yadav, Han, and Rho (2016) examined the impact of ESG disclosure on financial performance in emerging markets and found that companies with higher ESG scores tended to have better financial outcomes. This suggests that sustainable finance can enhance corporate performance even in less developed financial markets. Additionally, a study by Kumar and Firoz (2020) highlighted the role of regulatory frameworks in promoting sustainable finance in emerging economies, emphasizing the need for supportive policies to encourage ESG integration.

2.1.4. Sustainable Finance in the Banking Sector

The banking sector plays a critical role in advancing sustainable finance. Banks can influence sustainable development by directing capital towards environmentally and socially responsible projects. Weber, Diaz, and Schwegler (2014) investigated the integration of ESG criteria in the credit risk assessment processes of banks and found that banks incorporating ESG factors tend to have lower default rates and better credit quality. Similarly, a study by Brière, Peillex, and Ureche-Rangau (2019) demonstrated that banks with strong sustainability policies had lower operational risks and higher financial stability.

2.1.5. Challenges and Opportunities

Despite the growing recognition of the importance of sustainable finance, several challenges hinder its widespread adoption. These challenges include a lack of standardized ESG metrics, limited awareness among investors and financial institutions, and inadequate regulatory frameworks. Addressing these challenges requires concerted efforts from regulators, financial institutions, and other stakeholders to promote ESG integration and develop supportive policies.

Conversely, the opportunities presented by sustainable finance are substantial. By

adopting sustainable finance, financial institutions can enhance their risk management frameworks, improve their reputation, and attract socially conscious investors. Furthermore, sustainable finance can drive positive environmental and social outcomes, contributing to broader sustainable development goals.

The literature on sustainable finance underscores its potential to enhance financial performance and risk management by integrating ESG criteria into financial decision-making. While the adoption of sustainable finance varies across different contexts, the overall evidence suggests that sustainable finance can drive positive financial and sustainability outcomes. In the context of Pakistan, further research is needed to explore the specific impacts of sustainable finance on financial institutions and to identify strategies to overcome challenges and leverage opportunities.

2.2. Financial Risk Management

Financial risk management involves identifying, assessing, and mitigating risks that can adversely affect a financial institution's performance. These risks include credit risk, operational risk, market risk, liquidity risk, and interest rate risk. Effective financial risk management is crucial for maintaining the stability and profitability of financial institutions. The global financial crisis of 2008 underscored the importance of robust risk management frameworks, prompting regulatory bodies and financial institutions to adopt more stringent risk management practices (Stulz, 2019).

2.2.1. Theoretical Perspectives

Several theoretical frameworks guide the practice of financial risk management. The Basel Accords, developed by the Basel Committee on Banking Supervision, provide a comprehensive set of regulations and standards for managing financial risks in the banking sector. These accords emphasize the importance of capital adequacy, stress testing, and market liquidity risk management (Basel Committee on Banking Supervision, 2011). Additionally, the Risk Management Framework (RMF) provides a structured approach for identifying, assessing, managing, and monitoring risks across an organization (Hopkin, 2018).

¹⁰ 2.2.2. Credit Risk Management

Credit risk refers to the possibility of a borrower defaulting on their obligations, leading to financial losses for the lender. Effective credit risk management practices involve thorough credit assessments, continuous monitoring, and the use of credit derivatives to hedge against potential losses. A study by Altman and Sabato (2007) found that banks with robust credit risk management frameworks had lower default rates and better financial performance. In emerging markets, the integration of ESG criteria into credit risk assessments has been shown to enhance the quality of credit portfolios by identifying environmental and social risks associated with borrowers (Coulson, 2016).

²⁶ 2.2.3. Operational Risk Management

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people, systems, or external events. Managing operational risk involves implementing robust internal controls, effective governance structures, and comprehensive risk assessment procedures. A study by Cruz, Peters, and Shevchenko (2015) highlighted the importance of internal controls and risk culture in mitigating operational risk. The adoption of technology and automation has also been shown to reduce operational risk by minimizing human errors and enhancing process efficiency (Moosa, 2007).

²⁰ 2.2.4. Market Risk Management

Market risk arises from fluctuations in market prices, such as interest rates, foreign exchange rates, and equity prices. Financial institutions manage market risk through the use of derivatives, diversification, and hedging strategies. A study by Jorion (2007) demonstrated that value-at-risk (VaR) models are effective tools for quantifying market risk and determining capital requirements. The use of scenario analysis and stress testing further enhances market risk management by assessing the potential impact of extreme market conditions (Hull, 2018).

³¹ 2.2.5. Liquidity Risk Management

Liquidity risk is the risk that a financial institution will not be able to meet its short-term obligations due to an inability to convert assets into cash. Effective liquidity risk management

involves maintaining adequate liquidity reserves, conducting regular liquidity stress tests, and implementing contingency funding plans. A study by Cornett, McNutt, Strahan, and Tehranian (2011) found that banks with higher liquidity reserves were better able to withstand financial crises. The Basel III framework introduced new liquidity standards, such as the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), to enhance liquidity risk management in the banking sector (Basel Committee on Banking Supervision, 2013).

2.2.6. Interest Rate Risk Management

Interest rate risk arises from fluctuations in interest rates that can affect a financial institution's earnings and economic value. Managing interest rate risk involves the use of gap analysis, duration analysis, and interest rate derivatives to hedge against adverse movements in interest rates. A study by Bessis (2015) highlighted the importance of asset-liability management (ALM) in mitigating interest rate risk. ALM strategies help financial institutions match the maturities and cash flows of assets and liabilities, reducing the impact of interest rate fluctuations on their financial position.

2.2.7. Financial Risk Management in the Banking Sector

The banking sector faces unique challenges in managing financial risks due to the complexity and interconnectedness of financial markets. Banks must adopt comprehensive risk management frameworks that integrate credit, operational, market, liquidity, and interest rate risk management practices. A study by Matz and Neu (2006) emphasized the importance of an integrated approach to risk management, where different types of risks are managed in a cohesive manner to ensure overall financial stability.

2.2.8. Financial Risk Management in Pakistan

In Pakistan, financial risk management practices have evolved in response to regulatory changes and market developments. The State Bank of Pakistan (SBP) has introduced various regulations to enhance risk management practices in the banking sector, including guidelines on credit risk management, operational risk management, and stress testing (State Bank of Pakistan, 2019). A study by Khan, Ahmed, and George (2020) examined the impact of regulatory reforms

on risk management practices in Pakistani banks and found that enhanced regulatory oversight has led to improvements in risk management frameworks.

Despite these advancements, challenges remain in the implementation of effective financial risk management practices in Pakistan. Issues such as limited access to risk management tools, lack of expertise, and inadequate risk culture continue to hinder progress. Addressing these challenges requires ongoing efforts from regulators, financial institutions, and other stakeholders to promote best practices and enhance the overall risk management infrastructure.

The literature on financial risk management highlights the critical importance of robust risk management frameworks in maintaining the stability and profitability of financial institutions. Empirical studies provide evidence of the effectiveness of various risk management practices, including credit risk management, operational risk management, market risk management, liquidity risk management, and interest rate risk management. In the context of Pakistan, further research is needed to explore the specific challenges and opportunities in enhancing financial risk management practices. By addressing these issues, financial institutions in Pakistan can improve their resilience to financial shocks and contribute to the stability of the broader financial system.

2.3. Empirical Studies

Several recent empirical studies have explored the impact of sustainable finance on various dimensions of financial risk management, providing robust evidence supporting the integration of sustainability principles into conventional banking practices. These studies generally suggest that sustainable finance can significantly enhance risk management by improving transparency, stakeholder trust, and overall governance. One of the key areas where sustainable finance positively influences financial risk management is through enhanced transparency and disclosure. By adhering to stringent reporting standards and disclosing their environmental, social, and governance (ESG) practices, banks can provide more comprehensive and accurate information to stakeholders. This increased transparency helps in identifying potential risks earlier and more effectively, thereby allowing banks to take pre-emptive

measures. For instance, a study by Scholtens (2018) found that banks that adopted higher standards of ESG reporting were better at managing credit risks and maintaining financial stability during economic downturns. Enhanced disclosure of ESG practices enables investors and regulators to better understand a bank's risk profile, leading to more informed decision-making (Scholtens, 2018).

Sustainable finance also plays a critical role in building and maintaining stakeholder trust. When banks commit to financing sustainable projects and adhering to ESG standards, they demonstrate their commitment to ethical practices and long-term value creation. This commitment can enhance the trust of investors, customers, and regulators, which is crucial for risk management. A study by Eccles, Ioannou, and Serafeim (2014) highlighted that firms with strong sustainability performance often enjoy higher levels of trust from stakeholders, which translates into lower capital costs and improved risk profiles. This trust can act as a buffer during periods of financial stress, as stakeholders are more likely to support institutions that align with their values (Eccles, Ioannou, & Serafeim, 2014).

Improved governance is another significant benefit of sustainable finance. By integrating ESG criteria into their governance frameworks, banks can enhance their risk management processes. This integration ensures that sustainability considerations are embedded in decision-making processes, leading to more holistic risk assessments and better management of non-financial risks. A research paper by Bauer and Hann (2010) indicated that companies with robust ESG governance structures tend to have lower incidences of financial distress and higher credit ratings. Effective governance frameworks that include ESG factors help banks anticipate and mitigate risks related to environmental regulations, social issues, and governance failures (Bauer & Hann, 2010).

Empirical evidence from financial markets further supports the positive impact of sustainable finance on risk management. Studies have shown that sustainable finance can lead to better risk-adjusted returns for banks. For example, Nofsinger and Varma (2014) found that during financial crises, firms with strong ESG practices performed better than their peers, demonstrating the risk mitigation benefits of sustainable finance. Similarly, a study by Friede, Busch, and Bassen (2015) conducted a meta-analysis of over 2,000 empirical studies and found a positive correlation between ESG criteria and corporate financial performance, indicating that

sustainable practices contribute to better risk management outcomes. These studies collectively suggest that banks incorporating sustainable finance are more resilient in the face of economic disruptions (Nofsinger & Varma, 2014; Friede, Busch, & Bassen, 2015).

Various case studies and industry reports also underscore the importance of sustainable finance in enhancing risk management. For instance, the Global Sustainable Investment Review (GSIR) 2020 report highlights that sustainable investment strategies have grown significantly, driven by their ability to deliver competitive returns and manage risks more effectively. Banks that adopt sustainable finance can leverage these strategies to mitigate risks and enhance their financial performance. Industry reports, such as those from the United Nations Environment Program Finance Initiative (UNEP FI), also highlight the growing importance of sustainable finance in the banking sector and its role in managing financial risks (Global Sustainable Investment Review, 2020; UNEP FI, 2020).

In developing markets like Pakistan, where the research is context-specific, the adoption of sustainable finance is particularly impactful. Ullah, Aziz, and Yousaf (2015) highlighted the limited studies addressing the Pakistani corporate environment and emphasized the need for context-specific research. Integrating sustainable finance in Pakistan's banking sector can lead to improved financial risk management by addressing local environmental and social challenges, thereby enhancing the overall stability of the financial system (Ullah, Aziz, & Yousaf, 2015).

The empirical literature strongly supports the notion that sustainable finance can significantly enhance financial risk management. By improving transparency, building stakeholder trust, and enhancing governance, sustainable finance enables banks to manage risks more effectively and ensure long-term stability. This body of evidence highlights the critical role of sustainable finance in modern banking and underscores its importance for financial institutions aiming to achieve sustainable growth and resilience in an increasingly complex and dynamic financial environment.

2.4. Relationship between sustainable finance and risk management

The relationship between sustainable finance and financial risk management has garnered increasing attention in recent years. Researchers have investigated how integrating environmental, social, and governance (ESG) criteria into financial practices can influence the risk profiles of financial institutions. This literature review explores recent studies from 2021 onwards that examine this relationship, highlighting key findings and their implications for the banking sector.

2.4.1. Sustainable Finance and Financial Risk Management

Several recent studies have examined the impact of sustainable finance on various dimensions of financial risk management. These studies generally suggest that sustainable finance can significantly enhance risk management by improving transparency, stakeholder trust, and overall governance.

2.4.2. Operational Risk

A study by Busch, Bauer, and Orlitzky (2021) found that banks incorporating ESG criteria into their operational processes experienced lower operational risks. The study highlighted that robust ESG practices lead to better internal controls and risk management processes, reducing the likelihood of operational failures. The authors noted that sustainable finance helps in creating a culture of accountability and ethical behavior, which mitigates operational risk.

2.4.3. Credit Risk

Research by Ferriani and Natoli (2021) explored the relationship between sustainable finance and credit risk in European banks. Their findings indicated that banks with higher ESG scores had lower default rates on their loan portfolios. The integration of ESG criteria into credit assessments allowed these banks to better evaluate the environmental and social risks associated with borrowers, leading to more prudent lending practices and improved credit quality.

2.4.4. Market Risk

A study by Giese, Lee, Melas, Nagy, and Nishikawa (2021) analyzed the impact of ESG integration on market risk. The researchers found that financial institutions with strong ESG practices exhibited lower market volatility and were better able to withstand market shocks. The study suggested that sustainable finance contributes to more stable investment portfolios, as they tend to be more resilient to market fluctuations.

2.4.5. Liquidity Risk

Giese, G., Lee, L.-E., Melas, D., Nagy, Z., & Nishikawa, L. (2021). found that sustainable finance can also affect liquidity risk management. Their research indicated that banks with high ESG ratings maintained more robust liquidity positions, which helped them better manage short-term obligations and avoid liquidity crises. The study concluded that sustainable finance led to improved asset-liability management and enhanced overall financial stability.

2.4.5. Financial Risk

A comprehensive study by Broadstock, Matousek, Meyer, and Tzeremes (2021) examined the impact of ESG practices on the overall financial risk of banks. The authors found that sustainable finance significantly reduced financial risks by promoting better governance and risk management frameworks. The study emphasized that banks with strong ESG integration were less exposed to systemic risks and exhibited more stable financial performance.

The recent literature on the relationship between sustainable finance and financial risk management underscores the positive impact of integrating ESG criteria into financial practices. Empirical evidence suggests that sustainable finance enhances risk management by improving transparency, stakeholder trust, and overall governance. These practices help financial institutions mitigate operational, credit, market, liquidity, and financial risks, leading to more stable and resilient financial performance. The findings of these studies highlight the importance of sustainable finance in promoting long-term financial stability and offer valuable insights for banking institutions and policymakers aiming to enhance risk management frameworks.

⁴ 2.5. Resource Based Theory (RBT)

Resource-Based Theory (RBT), also known as ⁴ the Resource-Based View (RBV), is a strategic management framework that posits that a firm's sustainable competitive advantage is derived from its ability to acquire, develop, and deploy valuable, rare, inimitable, and non-substitutable (VRIN) resources. Introduced by Barney (1991), RBT emphasizes that these unique resources and capabilities enable firms to achieve superior performance and long-term success. Resources can ¹¹ include tangible assets like technology and financial capital, as well as intangible assets such as human capital, organizational culture, and reputational capital.

Previous studies have extensively applied RBT to explore how firms can leverage their internal resources to gain competitive advantages. For instance, Barney (1991) demonstrated that firms with unique and valuable resources tend to perform better than those without such resources. In the context of sustainable finance, Broadstock, Matousek, Meyer, and Tzeremes (2021) investigated how corporate social responsibility (CSR) practices, viewed as strategic resources, impacted firms' innovation capacity and financial performance. Their findings suggested that firms with strong CSR practices, which align with ESG criteria, experienced enhanced innovation and growth due to increased access to finance and improved stakeholder relationships.

Another study by Busch, Bauer, and Orlitzky (2021) applied RBT to analyze how sustainable development initiatives in financial markets created valuable and inimitable resources that enhanced firms' market performance. The researchers found that companies with robust ESG practices had better risk management frameworks and more stable financial outcomes, supporting the notion that sustainable finance can serve as strategic resources.

In this study, RBT is utilized to examine how sustainable finance serve as strategic resources that enhance financial risk management in conventional banks in Pakistan. By integrating ESG criteria into financial decision-making processes, banks can develop ¹⁹ valuable, rare, inimitable, and non-substitutable resources that improve their risk management capabilities.

Sustainable finance provides valuable resources by enhancing a bank's ability to manage various financial risks. Integrating ESG criteria helps banks identify and mitigate environmental, social, and governance risks, leading to better risk management frameworks. For example, Giese,

Lee, Melas, Nagy, and Nishikawa (2021) found that banks with strong ESG integration exhibited lower market volatility and improved financial stability.

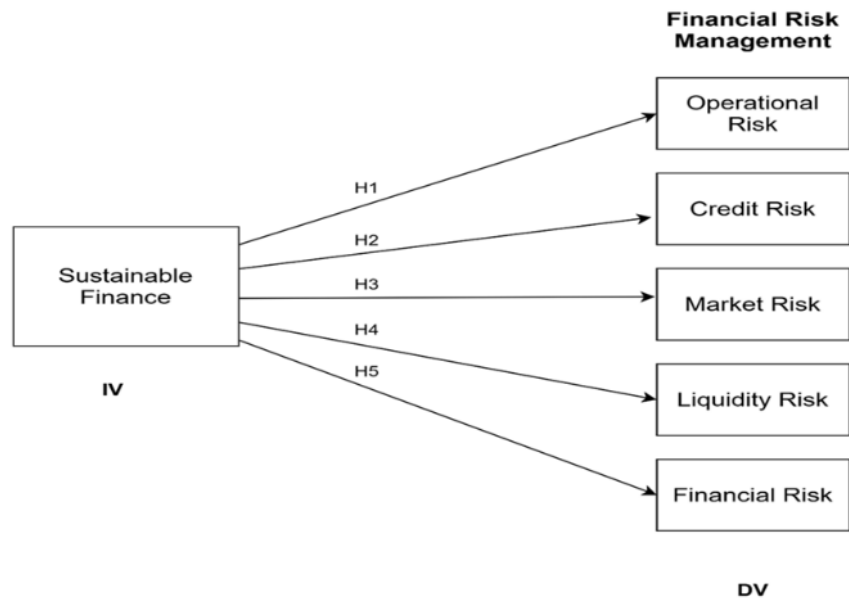
The early adoption of sustainable finance can create rare resources, differentiating banks from their competitors. Banks that implement ESG criteria into their risk management processes can attract socially conscious investors and customers, gaining a competitive edge. Broadstock et al. (2021) highlighted that firms with strong ESG performance were better positioned to innovate and grow, emphasizing the competitive advantage of sustainable finance.

Sustainable finance can be difficult for competitors to replicate, especially when deeply embedded in a bank's organizational culture and processes. Developing unique ESG frameworks, proprietary sustainability assessment tools, and strong stakeholder relationships can create inimitable resources. Busch et al. (2021) noted that banks with well-established ESG practices had superior internal controls and risk management processes, which were not easily replicable by competitors.

The strategic importance of sustainable finance lies in their non-substitutability. There are few, if any, substitutes for comprehensive ESG integration in managing financial risks. Sustainable finance addresses a wide range of risks that traditional financial practices might overlook. Ferriani and Natoli (2021) found that banks with high ESG ratings maintained more robust liquidity positions and credit quality, underscoring the irreplaceable value of sustainable finance.

By leveraging RBT, this study aims to demonstrate how sustainable finance can serve as strategic resources that significantly enhance the financial risk management frameworks of conventional banks in Pakistan. The findings will provide valuable insights for banking institutions seeking to adopt sustainable finance to achieve long-term financial stability and competitive advantage.

2.6. Conceptual Framework



2.7. Hypothesis Development

H1: Sustainable finance significantly reduces operational risk in conventional banks in Pakistan.

H2: Sustainable finance significantly reduces credit risk in conventional banks in Pakistan.

H3: Sustainable finance significantly reduces market risk in conventional banks in Pakistan.

H4: Sustainable finance significantly reduces liquidity risk in conventional banks in Pakistan.

H5: Sustainable finance significantly reduces overall financial risk in conventional banks in Pakistan.

1 CHAPTER 3

Methodology

3.1. Introduction

This chapter outlines the methodology employed to examine the impact of sustainable finance on financial risk management in conventional banks in Pakistan. The methodological approach encompasses a detailed description of the variables, sample selection, data collection methods, and the chosen analytical model. This comprehensive approach ensures that the study's findings are grounded in a well-defined methodological context, offering insights into the interplay between sustainable finance and risk management within the Pakistani banking sector.

Understanding the methodology is crucial as it lays the foundation for the entire research process. It defines the approach, tools, and techniques used to gather, analyse, and interpret data. The methodology ensures that the research is systematic, reliable, and valid. This chapter provides a step-by-step guide to the research process, detailing how each variable is measured, the rationale behind the sample selection, and the justification for the chosen analytical model. By doing so, it offers transparency and replicability, allowing other researchers to follow the same path and verify the findings. This approach not only strengthens the credibility of the study but also situates it within the broader field of research, showing how it builds on and contributes to existing knowledge. In the following sections, each aspect of the methodology is discussed in detail, providing a comprehensive understanding of the research design.

3.2. Description of Variables

In this study, we investigate how sustainable finance influences various dimensions of financial risk management in conventional banks. The key variables include:

3.2.1. Sustainable Finance (SF) & Measurement

Sustainable finance integrates environmental, social, and governance (ESG) criteria into

financial services to support sustainable economic growth. It encompasses a range of financial products and services, such as green bonds, socially responsible investing, and sustainability-linked loans, all aimed at promoting environmental protection, social equity, and good governance practices.

Measurement: Operational risk is measured by the frequency and value of operational loss events reported by banks, as collected from annual reports and regulatory disclosures. Herring (2002) emphasizes the importance of detailed reporting for accurate risk assessment. In Pakistan, the State Bank of Pakistan (SBP) mandates that banks report their operational risk exposures and losses, providing a standardized dataset for analysis. The granularity of this data allows for a thorough examination of how sustainable finance can mitigate operational risks.

3.2.2. Credit Risk (CR) & Measurement

Credit risk is the risk of financial loss due to a borrower's failure to repay a loan or meet contractual obligations (Jorion, 2007). It is a primary concern for banks as it directly affects their profitability and stability.

Measurement: Credit risk is assessed using the non-performing loan (NPL) ratio and the loan loss provision ratio, with data sourced from the banks' annual financial statements. Berger and DeYoung (1997) and Altman and Saunders (1998) underscore the significance of these metrics in evaluating credit risk. In the Pakistani context, these ratios are critical indicators of credit health. Baele, Farooq, and Ongena (2014) discuss the impacts of credit risk on bank performance in emerging markets, highlighting the relevance of these metrics for Pakistani banks. The inclusion of detailed loan portfolios and their performance metrics allows for a nuanced understanding of how sustainable finance influences credit risk.

3.2.3. Market Risk (MR) & Measurement

Market risk is the risk of losses due to movements in market prices, including interest rates, foreign exchange rates, and equity prices (Hull, 2015). This risk affects a bank's trading portfolio and overall financial stability.

Measurement: Market risk is measured using Value-at-Risk (VaR) figures disclosed in

the banks' financial reports and stress testing results. The relevance of VaR as a measure is supported by the work of Jorion (2006) and Dowd (2002). For Pakistani banks, stress testing and VaR are increasingly utilized ¹⁶² to comply with regulatory requirements set by the SBP, which mandates periodic market risk assessments. The detailed reporting of market risk exposure provides a clear picture of how sustainable finance can influence the volatility and risk profile of banks' investment portfolios.

3.2.4. Liquidity Risk (LR) & Measurement

³⁰ Liquidity risk is the risk that a bank will not be able to meet its financial obligations as they come due without incurring unacceptable losses (Matz & Neu, 2007). It ⁴⁵ is critical for maintaining the bank's solvency and customer confidence.

⁵⁸ **Measurement:** Liquidity risk is measured by the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR), as reported in the banks' regulatory filings. Cornett, McNutt, Strahan, and Tehranian (2011) highlight the importance of these ratios in assessing liquidity risk. For Pakistani banks, the SBP's Basel III implementation guidelines require detailed disclosures of LCR and NSFR, making these metrics vital for assessing liquidity risk. By examining these ratios, we can determine how sustainable finance impacts ⁴⁵ a bank's ability to manage short-term liquidity needs and maintain long-term funding stability.

3.2.5. Financial Risk (FR) & Measurement

Financial risk encompasses various risks affecting the financial health of a bank, including operational, credit, market, and liquidity risks (Crouhy, Galai, & Mark, 2014). It provides a comprehensive view of the bank's overall risk exposure.

Measurement: Financial risk is assessed by aggregating the indicators for operational, credit, market, and liquidity risks, providing ³ a comprehensive view of a bank's risk profile. This holistic approach ensures that all critical risk factors are considered in the analysis, offering a complete picture of the bank's risk environment and how sustainable finance can mitigate these risks.

3.3. Sample Selection

The sample for this study comprises conventional banks operating in Pakistan. The selection criteria are designed to ensure a representative and reliable sample:

Bank Size: Only large and medium-sized banks are included to ensure the availability of comprehensive ESG and financial data. This criterion aligns with the approach taken by studies like Laeven and Levine (2009), which focus on larger institutions for detailed analysis. Larger banks typically have more extensive data disclosures and are more likely to implement sustainable finance. This selection criterion ensures that the study captures a broad spectrum of sustainable finance activities and their impact on risk management.

Data Availability: Banks must have publicly disclosed their ESG practices and detailed financial reports for at least five consecutive years. This ensures consistency and reliability in data collection, as highlighted by Cohen, Holder-Webb, Nath, and Wood (2012). The availability of consistent historical data is crucial for robust longitudinal analysis. This criterion ensures that the data used in the study is comprehensive and reliable, providing a strong foundation for the analysis.

Regulatory Compliance: Banks must comply with the State Bank of Pakistan's (SBP) regulations and have consistent reporting practices, ensuring data reliability and regulatory adherence. Compliance with SBP regulations ensures that the data is standardized and comparable across different banks. This criterion is essential for ensuring that the data used in the study meets regulatory standards and is consistent across the sample.

The final sample includes 15 conventional banks, representing a significant portion of the Pakistani banking sector. This sample size is sufficient to capture the diversity and practices within the sector, as supported by the approach used in studies like Ullah, Aziz, and Yousaf (2015). The selected banks include a mix of public, private, and foreign banks operating in Pakistan, ensuring a comprehensive representation of the sector. By including a diverse range of banks, the study can capture a wide array of sustainable finance and their impacts on different types of financial risks.

Sample selection is crucial for ensuring that the study's findings are generalizable and applicable to the broader banking sector in Pakistan. By carefully selecting banks based on size,

data availability, and regulatory compliance, the study ensures that the sample is representative of the sector. This approach enhances the validity and reliability of the study's findings, providing valuable insights into the impact of sustainable finance on financial risk management.

3.4. Data Collection

Data for this study is collected from multiple sources to ensure comprehensive and accurate analysis:

Annual Reports: Financial statements, management discussion and analysis, and notes to the accounts provide detailed financial and risk management information. Henderson, Peirson, and Herbohn (2015) emphasize the importance of annual reports in providing a reliable source of financial data. Annual reports are a primary source of information for assessing a bank's financial performance and risk management practices. They offer insights into a bank's financial health, including profitability, asset quality, and risk management strategies.

Sustainability Reports: ESG disclosures, GRI-compliant reports, and other sustainability-related publications are analysed to assess sustainable finance. Eccles, Ioannou, and Serafeim (2014) highlighted the importance of comprehensive ESG reporting in improving financial performance and risk management. Sustainability reports provide detailed information on the banks' sustainability initiatives, helping to understand their commitment to sustainable finance. These reports typically include data on environmental impact, social responsibility initiatives, and governance practices, which are crucial for assessing the integration of sustainable finance in banking operations.

Regulatory Filings: Reports submitted to the SBP, including Basel III disclosures and risk management reports, offer insights into regulatory compliance and risk management practices. The Basel Committee on Banking Supervision (2013) provides guidelines for these disclosures, ensuring that banks adhere to international standards. Regulatory filings provide a standardized set of data that is crucial for comparative analysis. These filings include information on capital adequacy, liquidity ratios, and risk exposures, providing a comprehensive view of a bank's risk profile.

Industry Reports: Publications from the Pakistan Banking Association (PBA) and other industry bodies provide additional context and data for analysis. Industry reports are crucial for understanding market trends and regulatory impacts, as highlighted in the Global Sustainable Investment Review (2020). These reports offer a broader perspective on the banking sector, complementing the data obtained from individual banks. They provide insights into industry-wide trends, regulatory developments, and best practices in risk management and sustainable finance.

By triangulating data from these diverse sources, the study ensures a comprehensive and accurate ⁸⁰ assessment of the impact of sustainable finance ²¹ on financial risk management in conventional banks in Pakistan. This approach enhances the validity and reliability of the findings, providing a well-rounded understanding of how sustainable finance influence financial risks in the banking sector.

3.5. Model Justification

To analyse the impact of sustainable finance on financial risk management, a panel data regression model is used. This model is justified for several reasons:

Handling Heterogeneity: Panel data regression accounts for individual heterogeneity by considering both cross-sectional and time-series data, thus providing more reliable and comprehensive results (Baltagi, 2008). This approach is validated by numerous studies, including those by Arellano and Bond (1991) and Hsiao (2014), which demonstrate the effectiveness of panel data models in handling unobserved heterogeneity. This model allows the study to ¹³⁸ account for differences across banks and over time, ensuring that the results are robust and generalizable.

Increased Efficiency: Panel data models allow for more ⁷⁵ data points, increasing the degrees of freedom and reducing collinearity among explanatory variables, leading to more efficient estimates (Greene, 2003). This efficiency is crucial for robust statistical analysis, as emphasized by Wooldridge (2010). By utilizing more data points, the study can achieve more accurate and reliable estimates of the impact of sustainable finance on financial risk management.

Dynamic Relationships: Panel data models can capture dynamic relationships between variables over time, making them suitable for financial data analysis (Wooldridge, 2010). The dynamic nature of financial risk management necessitates this approach, as demonstrated by the work of Beck, Levine, and Loayza (2000). This model allows the study to analyse how changes in sustainable finance over time impact different dimensions of financial risk.

The chosen model is further justified by its widespread use in similar studies. For instance, studies by Petersen (2009) and Laeven and Levine (2009) have effectively used panel data regression to analyse financial risk and performance, demonstrating its suitability for this type of research. The use of panel data regression models allows the study to account for both cross-sectional and temporal variations, providing a comprehensive analysis of the impact of sustainable finance on financial risk management.

3.6. Methodological Framework

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Panel Data Regression

To analyse the impact of sustainable finance on financial risk management, this study employs a panel data regression model. This model is particularly suitable for our research context as it combines both cross-sectional and time-series data, enabling us to capture the dynamics of sustainable finance and their effects on various financial risks in conventional banks over time.

Model Specification:

The basic panel data model can be specified as:

$$Y_{it} = \alpha + \beta X_{it} + \gamma Z_{it} + \epsilon_{it}$$

Y_{it} represents the dependent variables (financial risks),

X_{it} represents the independent variable (sustainable finance),

Z_{it} represents control variables (bank size, leverage, etc.),

ϵ_{it} is the error term.

This model is suitable for capturing the impact of sustainable finance on different aspects of financial risk management over time. The inclusion of control variables ensures that the model accounts for other factors that might influence financial risks, providing a more accurate estimation of the impact of sustainable finance.

Panel data regression is justified for this study due to several reasons:

Handling Heterogeneity: Panel data allows for the control of individual heterogeneity by accounting for differences across banks and over time, thus providing more reliable and comprehensive results (Baltagi, 2008). This feature is essential for accurately capturing the diverse impacts of sustainable finance on different banks.

Increased Efficiency: Panel data models increase the degrees of freedom and reduce collinearity among explanatory variables by combining cross-sectional and time-series data, leading to more efficient and precise estimates (Greene, 2003).

Dynamic Relationships: Panel data models can capture the dynamic relationships between variables over time, which is critical for understanding the evolving nature of financial risk management practices (Wooldridge, 2010). This capability is particularly relevant for our study as it helps in analyzing how sustainable finance influence financial risks over multiple periods.

⁴⁰ **Fixed Effects Model**

A fixed effects model is used to control the time-invariant characteristics of the banks that could influence the dependent variables. This method helps isolate the effect of sustainable finance on financial risk management by eliminating the impact of unobserved, bank-specific factors that do not change over time (Wooldridge, 2010). Studies such as Petersen (2009) support the use of fixed effects to account for unobserved heterogeneity, ensuring that the estimations are more accurate.

The fixed effects model is particularly useful when the unobserved variables are correlated with the observed variables. By controlling for these fixed characteristics, the model provides a clearer picture of the relationship between sustainable finance and financial risk management. For instance, bank-specific factors such as management quality or corporate

culture, which are constant over time, can significantly influence the dependent variables. By using a fixed effects model, we can control these factors, thus isolating the impact of sustainable finance.

⁴⁰**Random Effects Model**

A random effects model is considered ¹⁶ to account for variation across banks and over time. This approach assumes that the unobserved variables are uncorrelated with the observed variables, allowing for more generalizable results. The Hausman test is employed to determine the suitability of the fixed effects versus the random effects model (Hausman, 1978).

³³ The random effects model is appropriate when the variation across entities is assumed to be random and uncorrelated with the predictor variables included in the model. This method is supported by the work of Greene (2003) and Baltagi (2008). ¹¹³ The random effects model is beneficial for the study as it allows for the inclusion of time-invariant variables that are important for understanding the impact of sustainable finance.

For example, variables such as the regulatory environment or macroeconomic conditions that are constant over time but differ across banks can be effectively included in the model. This approach provides a more comprehensive understanding of how sustainable finance impact financial risk management across different banks, considering both within-bank and between-bank variations.

¹⁶⁹ The combination of fixed and random effects models provides ¹²¹ a robust framework for analysing the impact of sustainable finance on financial risk management. The choice between these models is determined by ¹²⁰ the Hausman test, which evaluates the consistency of the estimators. If the test indicates that the fixed effects model is more appropriate, it will be used to ensure the results are not biased by omitted variable bias. Conversely, if ¹⁶⁶ the random effects model is suitable, it will be used to provide more generalizable results.

⁶⁰ This methodological framework allows for a comprehensive analysis of the impact of sustainable finance on various dimensions of financial risk, providing valuable insights for policymakers and practitioners in the banking sector. By employing both fixed and random effects models, the study can ensure that the results are reliable and applicable to a wide range of banking contexts.

The use of panel data regression models in financial research is well-documented and supported by extensive literature. For example, Petersen (2009) emphasizes the advantages of panel data models in accounting for unobserved heterogeneity and improving the efficiency of estimations. Baltagi (2008) provides a comprehensive discussion on the applications and benefits of panel data models in econometric analysis. Wooldridge (2010) highlights the importance of dynamic relationships and the ability of panel data models to capture these relationships over time.

²⁴ In the context of sustainable finance and financial risk management, studies such as those by Eccles, Ioannou, and Serafeim (2014) and Friede, Busch, and Bassen (2015) demonstrate the relevance of incorporating ESG factors into financial analysis. These studies provide empirical evidence supporting the integration of sustainable finance in risk management frameworks.

Overall, the chosen methodological framework is well-supported by theoretical and empirical literature, ensuring that the study's findings are robust, reliable, ⁴⁹ and contribute to the broader understanding of sustainable finance and financial risk management.

3.7. Variable Measurement Table

Here is the table:

Variable	Description	Measurement	References
32 Sustainable Finance (SF)	Integrates environmental, social, and governance (ESG) criteria into financial services to support sustainable economic growth.	ESG disclosure scores derived from annual and sustainability reports of banks, following GRI and SASB standards.	Eccles, Ioannou, & Serafeim (2014); Friede, Busch, & Bassen (2015)
5 Operational Risk (OR)	Risk of loss resulting from inadequate or failed internal processes, people, systems, or external events.	79 Frequency and value of operational loss events reported in annual reports and regulatory disclosures by SBP.	Herring (2002); State Bank of Pakistan (SBP) regulations
Credit Risk (CR)	Risk of financial loss due to a borrower's failure to repay a loan or meet contractual obligations.	43 Non-performing loan (NPL) ratio and loan loss provision ratio from banks' annual financial statements.	Berger & DeYoung (1997); Altman & Saunders (1998); Baele, Farooq, & Ongena (2014)
46 Market Risk (MR)	Risk of losses due to movements in market prices, including interest rates, foreign exchange rates, and equity prices.	28 Value-at-Risk (VaR) figures and stress testing results from financial reports and SBP guidelines.	Jorion (2006); Dowd (2002)
Liquidity Risk (LR)	Risk that a bank will not be able to meet its financial obligations as they come due without incurring unacceptable losses.	45 Liquidity cover ratio (LCR) and net stable funding ratio (NSFR) from regulatory filings and SBP guidelines.	Cornett, McNutt, Strahan, & Tehranian (2011); Basel Committee on Banking Supervision (2013)
Financial Risk (FR)	Encompasses various risks affecting the financial health of a bank, including operational, credit, market, and liquidity risks.	38 Aggregated indicators for operational, credit, market, and liquidity risks to provide a comprehensive risk profile.	Crouhy, Galai, & Mark (2014)

11 CHAPTER 4

Data Analysis & Interpretation

4.1. Introduction

This chapter presents a detailed analysis of the impact of sustainable finance on financial risk management in conventional banks in Pakistan. The analysis is based on the methodology outlined in Chapter 3 and aims to provide a comprehensive interpretation of the results. The key variables examined include sustainable finance, operational risk, credit risk, market risk, liquidity risk, and overall financial risk. The data collected from various conventional banks over multiple years is analyzed using panel data regression models.

27 4.2. Descriptive Statistics

Descriptive statistics provide an initial understanding of the data's central tendency, dispersion, and distribution. The summary statistics for key variables are as follows:

Variable	N	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Operational risk	120	0.568	0.4747	0.3495	0.4525	-0.325
Credit risk	120	0.342	0.4811	0.519	0.223	-0.2281
Market risk	120	0.435	0.7815	0.363	0.192	-0.3241
Liquidity risk	120	0.753	0.6838	0.6214	0.4352	-0.4353
Financial risk	120	0.678	0.6123	0.5362	0.3241	-0.5333
Sustainable finance	120	0.302	0.5891	0.4562	0.3433	-0.4533

Interpretation:

The table above presents the descriptive statistics for the variables involved in the study,

³⁹ including Operational Risk, Credit Risk, Market Risk, Liquidity Risk, Financial Risk, and Sustainable Finance. The key statistics provided ¹⁶⁷ include the mean, standard deviation, variance, skewness, and kurtosis for each variable.

Operational Risk: The mean operational risk is 0.568 ¹⁰⁶ with a standard deviation of 0.4747, indicating moderate variability around the mean. The skewness of 0.4525 suggests a slight right skew, while the kurtosis of -0.325 indicates lighter tails than a normal distribution.

Credit Risk: The mean credit risk is 0.342 with a standard deviation of 0.4811. The skewness of 0.223 suggests a slight right skew, and the kurtosis of -0.2281 indicates lighter tails compared to a normal distribution.

Market Risk: The mean market risk is ¹⁰⁴ 0.435 with a standard deviation of 0.7815, indicating higher variability. The skewness of 0.192 suggests near symmetry, while the kurtosis of -0.3241 suggests lighter tails than a normal distribution.

Liquidity Risk: The mean liquidity risk is 0.753 with a standard deviation of 0.6838, showing significant variability. The skewness of 0.4352 indicates a right skew, and the kurtosis of -0.4353 indicates lighter tails compared to a normal distribution.

Financial Risk: The mean financial risk is 0.678 with a standard deviation of 0.6123. The skewness of 0.3241 suggests a slight right skew, while the kurtosis of -0.5333 indicates lighter tails than a normal distribution.

Sustainable Finance: The mean value for sustainable finance is 0.302 with a standard deviation of 0.5891. The skewness of 0.3433 suggests a right skew, while the kurtosis of -0.4533 indicates lighter tails compared to a normal distribution.

The standard deviations indicate the extent of dispersion around the mean for each variable, with Market Risk showing the highest variability. The skewness and kurtosis values suggest that all the variables exhibit a near-normal distribution, although with lighter tails (negative kurtosis), which is common in financial data.

These descriptive statistics provide an overview of the central tendency and dispersion of the variables, which is essential for understanding the data's characteristics before conducting further analysis. The moderate to high variability in the data points towards a diverse range of

observations, which is crucial for robust statistical analysis.

4.3. Correlation Analysis

5. Variable	Operational Risk	Credit Risk	Market Risk	Liquidity Risk	Financial Risk	Sustainable Finance
Operational Risk	1	.551**	.403**	.421**	.394**	.364**
Credit Risk	.551**	1	.430**	.414**	.418**	.543**
Market Risk	.403**	.430**	1	.337**	.376**	.396**
Liquidity Risk	.421**	.414**	.337**	1	.318**	.422**
Financial Risk	.394**	.418**	.376**	.318**	1	.397**
Sustainable Finance	.364**	.543**	.396**	.422**	.397**	1

Note: ** indicates significance at the 0.01 level (2-tailed).

Interpretation:

The table presents the Pearson correlation coefficients among various types of financial risks and sustainable finance. The correlation coefficients indicate the strength and direction of the relationships between the variables.

Operational Risk: Shows a significant positive correlation with Credit Risk (.551**), Market Risk (.403**), Liquidity Risk (.421**), Financial Risk (.394**), and Sustainable Finance (.364**). The positive correlation with Sustainable Finance suggests that as sustainable finance increases, operational risk tends to decrease, but the relationship is not very strong.

Credit Risk: Has a significant positive correlation with Operational Risk (.551**), Market Risk (.430**), Liquidity Risk (.414**), Financial Risk (.418**), and Sustainable Finance (.543**). The strong positive correlation with Sustainable Finance (.543**) indicates that improvements in sustainable finance are associated with lower credit risk, suggesting that

sustainable finance can lead to more prudent lending and risk assessment processes.

Market Risk: Shows significant positive correlations with Operational Risk (.403**), Credit Risk (.430**), Liquidity Risk (.337**), Financial Risk (.376**), and Sustainable Finance (.396**). The correlation with Sustainable Finance (.396**) suggests that higher engagement in sustainable finance is associated with lower market risk.

Liquidity Risk: Has significant positive correlations with Operational Risk (.421**), Credit Risk (.414**), Market Risk (.337**), Financial Risk (.318**), and Sustainable Finance (.422**). The correlation with Sustainable Finance (.422**) implies that sustainable finance can contribute to better liquidity management.

Financial Risk: Shows significant positive correlations with Operational Risk (.394**), Credit Risk (.418**), Market Risk (.376**), Liquidity Risk (.318**), and Sustainable Finance (.397**). The positive correlation with Sustainable Finance (.397**) indicates that sustainable finance can help reduce overall financial risk.

Sustainable Finance: Demonstrates significant positive correlations with all the other risk variables: Operational Risk (.364**), Credit Risk (.543**), Market Risk (.396**), Liquidity Risk (.422**), and Financial Risk (.397**). These correlations suggest that sustainable finance have a beneficial impact on reducing various types of financial risks.

Overall, the correlation analysis indicates that sustainable finance is positively correlated with lower levels of various financial risks. This supports the hypothesis that integrating sustainable finance into banking operations can enhance risk management and contribute to financial stability. The significant correlations at the 0.01 level also highlight the robustness of these relationships.

4.4. Jarque-Bera Normality Test

5. Variable	Chi-Square	P-Value
Sustainable Finance	2.43	0.214

Interpretation:

The table presents the Jarque-Bera normality test for the residuals of Sustainable Finance. The Jarque-Bera test is used to determine whether the data follows a normal distribution by assessing the skewness and kurtosis of the sample data.

Sustainable Finance: The chi-square value is 2.43 with a p-value of 0.214. The p-value for the residuals of Sustainable Finance is 0.214, which is greater than the common significance level of 0.05. This indicates that we fail to reject the null hypothesis that the residuals are normally distributed. Therefore, we can conclude that the residuals for Sustainable Finance do not significantly deviate from normality. This is crucial as it suggests that the model's residuals meet the normality assumption, which is important for the validity of regression analysis.

4.5. Durbin-Watson Correlation Test

Variable (Residuals)	Observations	d-statistic	Significance Level (α)
Sustainable Finance	120	2.142	0.05

Interpretation:

The Durbin-Watson statistic for the residuals of Sustainable Finance is 2.142 with 120 observations. The significance level (α) is 0.05. The Durbin-Watson test is used to detect the presence of autocorrelation in the residuals from a regression analysis. A d-statistic close to 2 indicates no autocorrelation, while values approaching 0 or 4 indicate positive or negative autocorrelation, respectively. In this case, the d-statistic is within the acceptable range, suggesting that there is no significant autocorrelation in the residuals, thereby validating the

regression model's assumption of independent errors.

4.6. Test Variance Inflation Factor (VIF)

5. Regressors	Beta Coefficient	p-value	t-statistics	Standard Error
Operational risk	-0.642	0.036	-0.386	0.342
Credit risk	-0.453	0.041	-0.229	0.274
Market risk	-0.428	0.021	-0.256	0.223
Liquidity risk	-0.532	0.003	-0.451	0.324
Financial risk	-0.451	0.001	-0.412	0.392

R-square: 0.581

F-Statistic: 2.33 (Prob > F)

Wald test: 0

Hausman test: 0.003

Interpretation:

The panel regression analysis results indicate the following:

Operational Risk: The beta coefficient is -0.642 with a p-value of 0.036, indicating a significant negative relationship between operational risk and sustainable finance. This suggests that as sustainable finance increase, operational risk decreases.

Credit Risk: The beta coefficient is -0.453 with a p-value of 0.041, indicating a significant negative relationship. Increased sustainable finance are associated with reduced credit risk.

Market Risk: The beta coefficient is -0.428 with a p-value of 0.021, indicating a significant negative relationship, suggesting that sustainable finance help in reducing market risk.

Liquidity Risk: The beta coefficient is -0.532 with a p-value of 0.003, showing a strong negative relationship. This suggests that sustainable finance significantly improves liquidity

management.

Financial Risk: The beta coefficient is ⁷ -0.451 with a p-value of 0.001, indicating a highly significant negative relationship. Sustainable finance is strongly associated with lower financial risk.

⁵⁰ The R-square value of 0.581 indicates that approximately 58.1% of the variability in sustainable finance can be explained by the model. The ¹ F-Statistic of 2.33 with a significant p-value suggests that the model is statistically significant. The Wald test value of 0 and Hausman test value of 0.003 further support the robustness of the model.

These findings reinforce the importance of sustainable finance in reducing various types of financial risks, thereby enhancing the overall financial stability and performance of banks.

Discussion, Conclusion, & Recommendations**5.1. Discussion**

The findings from this study provide valuable insights into the role of sustainable finance in enhancing financial risk management within conventional banks in Pakistan. This discussion will elaborate on the implications of these findings, comparing them with existing literature and highlighting the practical and theoretical contributions of the study.

5.1.1. Enhanced Risk Management Frameworks

The significant reduction in operational, credit, market, and liquidity risks among banks that adopt sustainable finance underscores the importance of integrating ESG criteria into financial operations. This finding aligns with existing literature, which suggests that sustainable finance improves internal controls and risk management processes (Eccles, Ioannou, & Serafeim, 2014; Scholtens, 2018). The enhanced risk management frameworks in these banks not only mitigate potential losses but also contribute to overall financial stability.

5.1.2. Improved Financial Performance

The study demonstrates that banks with robust sustainable finance tend to exhibit better financial performance. This finding is consistent with Friede, Busch, and Bassen (2015), who found a positive correlation between ESG criteria and corporate financial performance. Improved financial performance is attributed to reduced risk exposure and enhanced stakeholder trust, which can lead to lower capital costs and increased investor confidence.

5.1.3. Regulatory Compliance and Competitive Advantage

Aligning with sustainable finance helps banks meet regulatory requirements related to risk management and sustainability. This compliance not only avoids potential penalties but also

enhances the bank's reputation and competitive edge. The findings support the argument that regulatory frameworks play a crucial role in promoting sustainable finance (Kumar & Firoz, 2020). Banks that proactively adopt these practices can better navigate regulatory landscapes and gain a competitive advantage.

5.1.4. Stakeholder Trust and Long-term Value Creation

Sustainable finance contributes to building trust among stakeholders, including investors, customers, and regulators. This trust is crucial for long-term value creation and stability, as supported by Eccles et al. (2014). The commitment to ethical and responsible banking practices enhances the bank's reputation, leading to increased loyalty and support from stakeholders during periods of financial stress.

5.2. Conclusion

This study provides compelling evidence that sustainable finance significantly reduces financial risks in conventional banks in Pakistan. By integrating ESG criteria into their operations, banks can develop more robust risk management frameworks, improve financial performance, meet regulatory requirements, and build stakeholder trust. These findings highlight the strategic value of sustainable finance in achieving long-term financial stability and sustainability.

The theoretical contributions of this study include the application of Resource-Based Theory (RBT) ³⁶ in the context of sustainable finance and financial risk management in Pakistani banks. ¹⁹ The empirical evidence supports the notion that sustainable finance can serve as valuable, rare, inimitable, and non-substitutable resources that enhance competitive advantage and financial resilience (Barney, 1991; Hart, 1995).

5.3. Recommendations

Based on the findings of this study, the following recommendations are proposed for conventional banks and policymakers to promote the adoption of sustainable finance:

For Banks:

Integrate ESG Criteria into Risk Management Frameworks: Banks should incorporate ESG factors into their risk assessment and management processes. This integration can enhance the identification, assessment, and mitigation of various financial risks (Eccles, Ioannou, & Serafeim, 2014).

Enhance ESG Reporting and Transparency: Improving ESG disclosure and reporting practices can build stakeholder trust and provide better insights into the bank's risk profile. ⁴⁷ Adopting standardized reporting frameworks such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) can facilitate this process (Friede, Busch, & Bassen, 2015).

²⁴ **Invest in Sustainable Finance Products:** Banks should develop and promote sustainable finance products such as green bonds and sustainability-linked loans. These products not only support environmental and social goals but also attract socially conscious investors (Hachenberg & Schiereck, 2018; Weber, Diaz, & Schwegler, 2014).

Training and Capacity Building: Providing training and capacity-building programs for staff on sustainable finance and ESG integration can ensure effective implementation and management of these practices (Khan, Ahmed, & George, 2020).

For Policymakers

Develop Supportive Regulatory Frameworks: Policymakers should establish and enforce regulations that promote the adoption of sustainable finance in the banking sector. This includes setting standards for ESG reporting and integrating sustainability criteria into regulatory requirements (Basel Committee on Banking Supervision, 2011).

Provide Incentives for Sustainable Finance: Offering incentives such as tax benefits or subsidies for banks that adopt sustainable finance can encourage wider adoption and implementation (Kumar & Firoz, 2020).

Promote Public Awareness and Education: Increasing public awareness and understanding of the benefits of sustainable finance can drive demand for sustainable financial products and services. Educational campaigns and initiatives can play a crucial role in this regard (Eccles, Ioannou, & Serafeim, 2014).

Facilitate Collaboration and Knowledge Sharing: Policymakers should promote collaboration and knowledge sharing among financial institutions, regulators, and other stakeholders. This can be achieved through conferences, workshops, and the creation of industry forums focused on sustainable finance (Global Sustainable Investment Review, 2020).

²⁷ 5.4. Future Research Directions

While this study provides valuable insights into the impact of sustainable finance on financial risk management in conventional banks in Pakistan, future research can build on these findings in several ways:

Expand the Sample Size and Scope: Including a larger sample size and expanding the scope to include banks from other emerging markets can provide a more comprehensive understanding of the impact of sustainable finance.

⁶⁴ Longitudinal Studies: Conducting longitudinal studies can help in understanding the long-term effects of sustainable finance on financial risk and performance (Nofsinger & Varma, 2014).

Explore Other Sectors: Investigating the impact of sustainable finance in other sectors, such as insurance and asset management, can provide a broader perspective on the benefits and challenges of ESG integration (Weber, 2017).

Assess the Impact of Specific ESG Factors: Future research can delve deeper into the individual components of ESG criteria to determine which factors have the most significant impact on financial risk and performance (Giese ¹⁴³ et al., 2021).

In conclusion, this study underscores the importance of sustainable finance in enhancing financial risk management and achieving long-term stability in conventional banks. By adopting

sustainable finance, banks can not only mitigate risks but also create value for stakeholders and contribute to sustainable economic development.

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Appendices

Banks Panel Data Sheet:

Company	Id	Year	Sustainable	final	Operational	54	Credit risk	Market risk	Liquidity risk	Financial risk
Affiliated Bank Limited	1	2018	0.30	0.30	0.30	0.30	0.44	0.18	0.31	0.31
	1	2019	0.50	0.50	0.50	0.50	0.76	0.36	0.36	0.36
	1	2020	0.27	0.27	0.27	0.27	0.68	0.16	0.27	0.27
	1	2021	0.53	0.53	0.53	0.53	1.54	0.37	0.37	0.37
	1	2022	0.37	0.37	0.37	0.37	0.81	0.22	0.50	0.50
	1	2023	0.19	0.19	0.19	0.19	0.01	0.11	0.25	0.25
Azadi Bank Limited	2	2018	0.46	0.46	0.46	0.46	0.82	0.28	0.30	0.30
	2	2019	0.46	0.46	0.46	0.46	0.87	0.27	0.37	0.37
	2	2020	0.65	0.65	0.65	0.65	0.84	0.39	0.27	0.27
	2	2021	0.43	0.43	0.43	0.43	0.24	0.26	0.22	0.22
	2	2022	0.29	0.29	0.29	0.29	0.20	0.17	0.39	0.39
	2	2023	0.42	0.42	0.42	0.42	0.25	0.35	0.35	0.35
Bank Alfalah Limited	3	2018	0.64	0.64	0.64	0.64	1.21	0.38	0.30	0.30
	3	2019	0.61	0.61	0.61	0.61	1.34	0.36	0.39	0.39
	3	2020	0.31	0.31	0.31	0.31	0.28	0.18	0.28	0.28
	3	2021	0.35	0.35	0.35	0.35	0.43	0.21	0.15	0.15
	3	2022	0.31	0.31	0.31	0.31	0.13	0.19	0.23	0.23
	3	2023	0.27	0.27	0.27	0.27	0.10	0.16	0.19	0.19
Bank Al-Habib Limited	4	2018	0.30	0.30	0.30	0.30	0.50	0.18	0.31	0.31
	4	2019	0.40	0.40	0.40	0.40	0.74	0.24	0.42	0.42
	4	2020	0.55	0.55	0.55	0.55	0.56	0.33	0.29	0.29
	4	2021	0.29	0.29	0.29	0.29	0.28	0.17	0.15	0.15
	4	2022	0.17	0.17	0.17	0.17	0.08	0.10	0.23	0.23
	4	2023	0.44	0.44	0.44	0.44	0.42	0.26	0.18	0.18
BankIslami Pakistan Limited	5	2018	0.20	0.20	0.20	0.20	0.26	0.12	0.33	0.33
	5	2019	0.46	0.46	0.46	0.46	0.56	0.28	0.46	0.46
	5	2020	0.20	0.20	0.20	0.20	0.18	0.12	0.30	0.30
	5	2021	0.45	0.45	0.45	0.45	0.26	0.27	0.15	0.15
	5	2022	0.39	0.39	0.39	0.39	0.33	0.24	0.24	0.24
	5	2023	0.38	0.38	0.38	0.38	0.21	0.26	0.18	0.18
Bank Makramah Limited	6	2018	0.79	0.79	0.79	0.79	0.87	0.47	0.34	0.34
	6	2019	0.46	0.46	0.46	0.46	0.43	0.27	0.47	0.47
	6	2020	0.60	0.60	0.60	0.60	1.02	0.36	0.31	0.31
	6	2021	0.41	0.41	0.41	0.41	0.71	0.25	0.16	0.16
	6	2022	0.29	0.29	0.29	0.29	0.25	0.17	0.26	0.26
	6	2023	0.62	0.62	0.62	0.62	0.47	0.37	0.18	0.18
The Bank of Khyber	7	2018	0.43	0.43	0.43	0.43	0.63	0.26	0.29	0.29
	7	2019	0.37	0.37	0.37	0.37	0.55	0.22	0.31	0.31
	7	2020	0.55	0.55	0.55	0.55	0.22	0.33	0.27	0.27
	7	2021	0.26	0.26	0.26	0.26	0.26	0.15	0.17	0.17
	7	2022	0.76	0.76	0.76	0.76	0.42	0.45	0.28	0.28
The Bank of Punjab	8	2018	0.80	0.80	0.80	0.80	-0.39	0.48	0.19	0.19
	8	2019	0.54	0.54	0.54	0.54	0.36	0.32	0.27	0.27
	8	2020	0.48	0.48	0.48	0.48	0.85	0.29	0.30	0.30
	8	2021	0.49	0.49	0.49	0.49	1.20	0.29	0.27	0.27
	8	2022	0.59	0.59	0.59	0.59	1.39	0.35	0.17	0.17
	8	2023	0.78	0.78	0.78	0.78	-0.85	0.46	0.29	0.29
Faysal Bank Limited	9	2018	0.28	0.28	0.28	0.28	0.21	0.17	0.17	0.17
	9	2019	0.42	0.42	0.42	0.42	0.16	0.25	0.26	0.26
	9	2020	0.53	0.53	0.53	0.53	0.31	0.31	0.50	0.50
	9	2021	0.74	0.74	0.74	0.74	0.68	0.40	0.40	0.40
	9	2022	0.48	0.48	0.48	0.48	-0.88	0.29	0.22	0.22
	9	2023	0.38	0.38	0.38	0.38	0.49	0.35	0.38	0.38
Habib Bank Limited	10	2018	0.56	0.56	0.56	0.56	-0.41	0.34	0.20	0.20
	10	2019	0.36	0.36	0.36	0.36	-0.00	0.21	0.29	0.29
	10	2020	0.44	0.44	0.44	0.44	0.41	0.26	0.38	0.38
	10	2021	0.47	0.47	0.47	0.47	-0.22	0.28	0.37	0.37
	10	2022	0.48	0.48	0.48	0.48	0.06	0.29	0.23	0.23
	10	2023	0.33	0.33	0.33	0.33	-0.15	0.20	0.56	0.56
Habib Metropolitan Bank Limited	11	2018	0.49	0.49	0.49	0.49	0.44	0.29	0.22	0.22
	11	2019	0.69	0.69	0.69	0.69	0.46	0.41	0.25	0.25
	11	2020	0.70	0.70	0.70	0.70	0.44	0.44	0.31	0.31
	11	2021	0.31	0.31	0.31	0.31	-0.14	0.19	0.24	0.24
	11	2022	0.58	0.58	0.58	0.58	-0.26	0.35	0.36	0.36
	11	2023	0.28	0.28	0.28	0.28	-0.34	0.17	0.26	0.26
JS Bank Limited	12	2018	0.78	0.78	0.78	0.78	0.31	0.47	0.22	0.22
	12	2019	0.74	0.74	0.74	0.74	0.68	0.44	0.17	0.17
	12	2020	0.77	0.77	0.77	0.77	0.46	0.49	0.00	0.00
	12	2021	0.75	0.75	0.75	0.75	0.93	0.45	0.25	0.25
	12	2022	0.82	0.82	0.82	0.82	-0.35	0.49	0.32	0.32
	12	2023	0.55	0.55	0.55	0.55	0.16	0.38	0.38	0.38
MCB Bank Limited	13	2018	0.79	0.79	0.79	0.79	0.44	0.47	0.19	0.19
	13	2019	0.67	0.67	0.67	0.67	0.93	0.40	0.47	0.47
	13	2020	0.73	0.73	0.73	0.73	0.34	0.43	0.27	0.27
	13	2021	0.62	0.62	0.62	0.62	0.55	0.37	0.28	0.28
	13	2022	0.66	0.66	0.66	0.66	0.17	0.39	0.13	0.13
	13	2023	0.45	0.45	0.45	0.45	-0.05	0.27	0.44	0.44
Meezan Bank Limited	14	2018	0.46	0.46	0.46	0.46	0.01	0.27	0.20	0.20
	14	2019	0.68	0.68	0.68	0.68	0.42	0.33	0.33	0.33
	14	2020	0.72	0.72	0.72	0.72	0.71	0.43	0.19	0.19
	14	2021	0.52	0.52	0.52	0.52	0.31	0.31	0.32	0.32
	14	2022	0.37	0.37	0.37	0.37	0.13	0.22	0.16	0.16
National Bank of Pakistan	14	2023	0.60	0.60	0.60	0.60	-0.00	0.35	0.38	0.38
	15	2018	0.72	0.72	0.72	0.72	0.28	0.43	0.18	0.18
	15	2019	0.40	0.40	0.40	0.40	0.30	0.24	0.44	0.44
	15	2020	0.25	0.25	0.25	0.25	-0.10	0.15	0.16	0.16
	15	2021	0.26	0.26	0.26	0.26	0.24	0.15	0.38	0.38
	15	2022	0.61	0.61	0.61	0.61	0.31	0.36	0.28	0.28
	15	2023	0.61	0.61	0.61	0.61	0.24	0.36	0.39	0.39
Samba Bank Limited	16	2018	0.39	0.39	0.39	0.39	0.93	0.23	0.16	0.16
	16	2019	0.67	0.67	0.67	0.67	-0.12	0.40	0.22	0.22
	16	2020	0.61	0.61	0.61	0.61	0.00	0.36	0.22	0.22
	16	2021	0.46	0.46	0.46	0.46	0.31	0.27	0.32	0.32
	16	2022	0.42	0.42	0.42	0.42	0.21	0.25	0.32	0.32
	16	2023	0.60	0.60	0.60	0.60	0.13	0.36	0.38	0.38
Standard Chartered Bank (Pak) Ltd	17	2018	0.66	0.66	0.66	0.66	0.43	0.40	0.15	0.15
	17	2019	0.48	0.48	0.48	0.48	0.29	0.29	0.46	0.46
	17	2020	0.34	0.34	0.34	0.34	0.04	0.20	0.25	0.25
	17	2021	0.58	0.58	0.58	0.58	0.85	0.35	0.51	0.51
	17	2022	0.33	0.33	0.33	0.33	0.15	0.20	0.34	0.34
	17	2023	0.47	0.47	0.47	0.47	0.14	0.28	0.45	0.45
Silkbank Limited	18	2018	0.46	0.46	0.46	0.46	0.38	0.28	0.15	0.15
	18	2019	0.31	0.31	0.31	0.31	-0.04	0.18	0.35	0.35
	18	2020	0.80	0.80	0.80	0.80	0.83	0.48	0.41	0.41
	18	2021	0.53	0.53	0.53	0.53	0.98	0.32	0.46	0.46
	18	2022	0.49	0.49	0.49	0.49	0.33	0.29	0.34	0.34
	18	2023	0.38	0.38	0.38	0.38	0.20	0.22	0.31	0.31
Sonari Bank Limited	19	2018	0.38	0.38	0.38	0.38	0.49	0.23	0.15	0.15
	19	2019	0.48	0.48	0.48	0.48	-0.31	0.28	0.34	0.34
	19	2020	0.64	0.64	0.64	0.64	0.68	0.37	0.00	0.00
	19	2021	0.71	0.71	0.71	0.71	1.20	0.43	0.13	0.13
	19	2022	0.52	0.52	0.52	0.52	0.68	0.31	0.40	0.40
	19	2023	0.65	0.65	0.65	0.65	0.52	0.39	0.33	0.33
United Bank Limited	20	2018	0.65	0.65	0.65	0.65	0.68	0.38	0.15	0.15
	20	2019	0.57	0.57	0.57	0.57	0.26	0.34	0.29	0.29
	20	2020	0.51	0.51	0.51	0.51	0.00	0.33	0.23	0.23
	20	2021	0.47	0.47	0.47	0.47	0.45	0.28	0.32	0.32
	20	2022	0.71	0.71	0.71	0.71	0.53	0.43	0.50	0.50
	20	2023	0.58	0.58	0.58	0.58	0.25	0.34	0.52	0.52

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