



Faculty of Economics and Business

**An Investigation of Banks' Sustainable Performance in Pakistan from
the Internal and External Perspectives**

Muhammad Sadiq Malik

**Doctor of Philosophy
2024**

An Investigation of Banks' Sustainable Performance in Pakistan from the
Internal and External Perspectives

Muhammad Sadiq Malik

A thesis submitted

In fulfillment of the requirements for the degree of Doctor of Philosophy

(Finance)

Faculty of Economics and Business
UNIVERSITI MALAYSIA SARAWAK

2024

DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.


.....

Signature

Name: Muhammad Sadiq Malik

Matric No.: 19010019

Faculty of Economics and Business

Universiti Malaysia Sarawak

Date: 01 February 2024

ACKNOWLEDGEMENT

I humbly bow my head in front of Allah Almighty, who blessed me with intellect and dedication to fulfill this challenge of completing my doctor of philosophy in time. Countless salutations are on the Holy Prophet Muhammad (PBUH), the city of knowledge, who guided all humanity to seek knowledge from the cradle to the grave. I will dedicate my work to Sahibzada Sultan Muhammad Ali, the founding father of MUSLIM Institute and 10th decedent of Hazrat Sultan Banoo (who wrote 140 books), Sahibzada Sultan Muhammad Ali inspired and encouraged me to do Ph.D. (Finance). I will convey special gratitude to Sahibzada Sultan Ahmed Ali, Chairman of MUSLIM Institute, Islamabad, Pakistan, who guided me in selecting the thesis topic and variables of this thesis.

My mother, Sunar Khatoon, deserves special thanks for her prayers which are always the beacon source for me; she is the ideal mother. May Allah bless her. My brother and best friend, Muhammad Hanif Awan stood with me during hard times, and his support and positive talk always remained a cool breeze for me. I will always cherish the support of my wife, Sadia Sadiq Malik, my sons Tahir Aziz, Safdar Hussain and Junaid Muhammad, and my intellectual daughters, Aisha Malik and Aamna Malik.

I gratefully acknowledge Dr. Sophee Sulong, the main supervisor who extended full guidance, Faculty of Business and Economics, Universiti Malaysia Sarawak. I truly value his support even at the peak of the pandemic of Covid-19. Without his supervision and professional guidance, it was impossible to complete this thesis. He is very humble, and motivated, and always guided me logically. I am also grateful to Prof Dr. Rossazana Bt Ab Rahim, my Co-Supervisor and Dean FEB. Her response was always prompt, starting from

my proposal defense, papers publications, and thesis writing. May Allah reward her for her work for the education of her students.

I would specifically mention the role of Prof. Dr Naveed Iqbal Chaudhry, Director-General of the University of Punjab (Gujranwala Campus) Pakistan. Due to the pandemic of Covid-19, he was also nominated as my Co-supervisor from Pakistan. He has a great personality, is highly professional in thesis supervision, is a great mentor, and possesses sound research knowledge. He is a genuine specimen of a gentleman and a great teacher. He guided me throughout the writing of every chapter, especially methodology and data analysis. I am lucky that he is my teacher.

I am highly thankful to one of my sincere friends, Waqar Munir, my class fellow in UNIMAS, who was always with me in my Ph.D. journey whenever I needed research guidance and the expert opinion of a good human being. All my friends and teachers helped me in this journey, and I am highly thankful.

ABSTRACT

This research aims to empirically investigate the impact of internal factors (efficiency, profitability, and risk management capability) and external factors (Gross Domestic Product (GDP), inflation, interest rate, and the exchange rate) on the sustainable performance of banks in Pakistan. The sustainable performance of the banking sector in Pakistan is affected due to these contributing factors which are impacting the economy. The contingency theory and environmental, social, and governance (ESG) model have been applied to the framework of this thesis. This is a cross-sectional study using five years panel data from 2016-2020 of 32 banks in Pakistan. The stationarity of the data was checked through a unit root test. The OLS Panel Methods; Random, and Fixed Effect Model were used for quantitative analysis and testing of hypotheses. Results indicate that internal and external factors significantly impact the sustainable performance of banks in Pakistan except for inflation, and interest rates. The outcome of the study indicates the vital role of these variables in ascertaining the overall sustainable performance of banks in Pakistan. Policymakers, management, and investors can assess sustainable performance through the same framework. This research is a pioneer in Pakistan by providing new avenues for future studies on banks' sustainable performance through internal and external perspectives and its contribution to the existing global literature.

Keywords: Sustainable performance, efficiency, profitability, risk management capability, external factors.

Siasatan Prestasi Mampan Bank di Pakistan dari Perspektif Dalaman dan Luaran

ABSTRAK

Penyelidikan ini bertujuan untuk menyiasat secara empirikal kesan faktor dalaman (kecekapan, keuntungan, dan keupayaan pengurusan risiko) dan faktor luaran (Keluaran Dalam Negara Kasar (KDNK), inflasi, kadar faedah, dan kadar pertukaran) terhadap prestasi mampan bank di Pakistan. Prestasi mampan sektor perbankan di Pakistan terjejas disebabkan oleh faktor penyumbang ini yang memberi kesan kepada ekonomi. Teori kontingensi dan model persekitaran, sosial dan tadbir urus (ESG) telah digunakan dalam rangka kerja tesis ini. Ini adalah kajian keratan rentas menggunakan lima tahun dari 2016-2020 dan data panel 32 bank di Pakistan. Kemantapan data telah disemak melalui ujian akar unit. Kaedah Panel OLS; Model Rawak dan Kesan Tetap digunakan untuk analisis kuantitatif dan ujian hipotesis. Keputusan menunjukkan bahawa faktor dalaman dan luaran memberi kesan ketara kepada prestasi mampan bank di Pakistan kecuali inflasi dan kadar faedah. Hasil kajian menunjukkan bahawa peranan penting pembolehubah ini dalam memastikan prestasi keseluruhan bank yang mampan di Pakistan. Penggubal dasar, pengurusan dan pelabur boleh menilai prestasi mampan melalui rangka kerja yang sama. Penyelidikan ini merupakan perintis di Pakistan dengan menyediakan jalan baharu untuk kajian masa depan mengenai prestasi mampan bank melalui perspektif dalaman dan luaran serta sumbangannya terhadap kesusasteraan global sedia ada..

Kata kunci: *Prestasi mampan, kecekapan, keuntungan, keupayaan pengurusan risiko, faktor luaran.*

TABLE OF CONTENTS

	Page
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iv
ABSTRAK	v
TABLE OF CONTENTS	vi
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xiv
CHAPTER 1 INTRODUCTION	1
1.1 Study Background	1
1.1.1 Overview of the Pakistani Banking Sector	5
1.1.2 Latest Trends in the Banking Sector in Pakistan	9
1.2 Problem Statement	11
1.3 Objectives of the Study	17
1.3.1 General Objective	17
1.3.2 Specific Objectives	17
1.4 Research Questions	17
1.5 Scope of the Research	18

1.6	Significance of Research	19
1.6.1	Theoretical Contribution	19
1.6.2	Methodological Contribution	20
1.6.3	Practical Contribution	20
1.6.4	Social Contribution	21
1.7	Organization of Thesis	22
1.8	Chapter Summary	24
CHAPTER 2	LITERATURE REVIEW	25
2.1	Overview	25
2.2	Sustainable Performance of Banks	25
2.3	Research Gap	28
2.4	Internal Factors and Sustainable Performance	30
2.4.1	Bank's Efficiency (Internal Factor)	30
2.4.2	Bank's Profitability (Internal Factor)	34
2.4.3	The bank's Risk Management Capability (Internal Factor)	35
2.5	Relationship between Efficiency and Sustainable Performance	36
2.6	Relationship between Profitability and Sustainable Performance	40
2.7	Relationship between RMC and Sustainable Performance	44
2.8	External Factors and Sustainable Performance	49
2.8.1	Relationship between GDP and Sustainable Performance	49

2.8.2	Relationship between Inflation and Sustainable Performance	50
2.8.3	Relationship between Interest Rate and Sustainable Performance	51
2.8.4	Relationship between Exchange Rate and Sustainable Performance	52
2.9	Control Variables	53
2.9.1	Bank Size (Control Variable)	54
2.9.2	Loan Intensity (Control Variable)	55
2.9.3	Financial Leverage (Control Variable)	55
2.9.4	Credit Risk (Liquidity) (Control Variable)	56
2.10	Underpinning Theories	57
2.10.1	Contingency Theory	57
2.10.2	Banking Theories	60
2.10.3	Environmental Social Governance (ESG) Model	61
2.11	Hypothesis Development	63
2.11.1	Internal Factors	63
2.11.2	External Factors	63
2.12	Framework of Research	64
2.13	Chapter Summary	64
CHAPTER 3	METHODOLOGY	67
3.1	Overview	67
3.2	Research Philosophy	69

3.3	Research Approaches	71
3.4	Research Methodology	72
3.5	Research Strategy	75
3.6	Research Design	75
3.7	Research Population and Sampling	76
3.8	Data Collection Methods	78
3.9	Econometric Model	78
3.10	Data Analysis Techniques	79
3.10.1	Fixed-Effect (FE) Model	81
3.10.2	Random-Effect (RE) Model	81
3.10.3	Unit Root Test	82
3.10.4	Cross-Sectional Dependence Test	82
3.10.5	Cointegration Test	83
3.11	Measurement of Dependent Variable	84
3.12	Measurement of Independent Variables	86
3.12.1	Internal Factors	86
3.12.2	External Factors	88
3.13	Measurement of Control Factor	89
3.13.1	Bank Size (Control Variable)	89
3.13.2	Loan Intensity (Control Variable)	90

3.13.3 Financial Leverage (Control Variable)	91
3.13.4 Credit Risk (Control Variable)	91
3.14 Ethical Considerations	94
3.15 Chapter Summary	95
CHAPTER 4 RESULTS AND ANALYSIS	96
4.1 Overview	96
4.2 Descriptive Analysis	96
4.3 Unit Root Test	101
4.4 Cross-Sectional Dependence Test	103
4.5 Cointegration Test	104
4.6 Correlation Analysis	104
4.7 Regression Analysis	110
4.8 Discussion on Results	120
4.9 Impact of Internal Factors on Sustainable Performance of Banks	121
4.9.1 Impact of Efficiency on Banks' Sustainable Performance	121
4.9.2 Impact of Profitability on Banks' Sustainable Performance	124
4.9.3 Impact of Risk Management Capability on Sustainable Performance of Banks	127
4.10 Impact of External Factors on Sustainable Performance of Banks	130
4.10.1 Impact of GDP on Sustainable Performance of Banks	130
4.10.2 Impact of Inflation on Sustainable Performance of Banks	131

4.10.3	Impact of Exchange Rate on Sustainable Performance of Banks	132
4.10.4	Impact of Interest Rate on Sustainable Performance of Banks	134
4.11	Other Factors and on Sustainable Performance of Banks	135
4.12	Chapter Summary	138
CHAPTER 5	CONCLUSION AND RECOMMENDATIONS	141
5.1	Overview	141
5.2	Summary of Results	141
5.3	Relation of Results with Research Objectives	144
5.3.1	General Objective	144
5.3.2	Specific Objectives	144
5.4	Research Implications	148
5.4.1	Theoretical Implications	148
5.4.2	Practical Implications	150
5.4.3	Social Implications	151
5.5	Limitations of Study	151
5.6	Recommendations for Future Research	153
5.7	Conclusion	155
REFERENCES		157
APPENDICES		190

LIST OF TABLES

	Page
Table 1.1: Different Categories of Banks in Pakistan	5
Table 1.2: Scheduled Banks Deposit Analysis	8
Table 3.1: Measurement Proxies for the Variables	93
Table 4.1: Descriptive Analysis	97
Table 4.2: Unit Root Tests	102
Table 4.3: Cross-Sectional Dependence	104
Table 4.4: Contigeration Test	104
Table 4.5: Correlation Analysis	106
Table 4.6: Regression Analysis (Panel OLS)	110
Table 4.7: Regression Analysis (RE)	112
Table 4.8: Regression Analysis (FE)	114
Table 4.9: Regression Analysis (PEGL - CS)	116
Table 4.10: Panel Fixed Effects (Cross Sectional Weights)	117
Table 4.11: Hypotheses Status	119

LIST OF FIGURES

	Page
Figure 1.1: Customer and Financial Institution Deposits Versus Local and Foreign Deposits	9
Figure 2.3: ESG Model in the Banking Sector.	27
Figure 2.4: Relationship between Sustainability and Financial Performance	41
Figure 2.5: The Relationship between Sustainable Performance and Profitability	42
Figure 2.4: Contingency Theory Framework.	59
Figure 2.5: ESG Framework.	62
Figure 2.6: Framework for Sustainable Performance of Banks	64
Figure 3.1: The Research Process.	67
Figure 3.2: The Research Onion.	69
Figure 3.3: Difference between Deductive and Inductive Approaches	71
Figure 3.4: Mind Map of Quantitative Research Methodology.	74
Figure 3.5: Qualitative Research Methodology Mind Map.	74
Figure 4.1: Quantiles of Normal	109
Figure 4.2: Normality	115
Figure 4.3: Model Normality	118

LIST OF ABBREVIATIONS

BMR	Balancing, Modernization, and Replacement
BPF	Banks Performance Framework
CEO	Chief Executive Officer
CPEC	China-Pakistan Economic Corridor
DEA	Data Envelopment Analysis
FATF	Financial Action Task Force
Fintech	Financial Technology
FY	Financial Year
GDP	Gross Domestic Product
GFC	Global Financial Crisis
H	Hypothesis
IUCN	International Union for Conservation of Nature and Natural Resources
MPC	Monetary Policy Committee
NIM	Net Interest Margin
PACRA	Pakistan Credit Rating Agency
PTE	Pure Technical Efficiency
PKR	Pakistan Rupees
ROA	Return on Asset
ROE	Return on Equity
RMC	Risk Management Capability
SE	Scale Efficiency
Ser	Serial

SBP	State Bank of Pakistan
TE	Technical Efficiency
TERE	Temporary Economic Refinance Facility
WDI	World Development Indicators

CHAPTER 1

INTRODUCTION

1.1 Study Background

Humanity can promote sustainable performance to ensure the fulfillment of the current needs of the people without compromising the capability of future generations to fulfill their needs. Therefore, in the financial sector, sustainable performance focuses on creating value for its shareholders while incorporating social and environmental development. "Agenda for Sustainable Development and the European Commission" (involves 17 global goals sustainable development goals (SDGs) adopted by United Nations in 2015 such as climate change, inequalities and poverty) has stated the essential factors of sustainable performance, which include environmental protection, innovation development, sustainable energy accessibility, utilization of environment-friendly technologies, raising customer awareness, and making improvements for the development of enterprise (Korzeb & Samaniego-Medina, 2019). Banks are the vital part of the financial sector; it plays an important role sustainable development by aligning their practices with the goals mentioned in the "Agenda for sustainable development and European commission". It involves integrating environmental innovation, protection access to sustainable energy along with the customer awareness in their operations. In this way, banks significantly contribute towards the gross domestic production (GDP) of the country along with simultaneously promoting environmental and social well-being. Therefore, banks are an essential financial sector contributing to a country's GDP. The significance of banks is inevitable in modern economies despite the financial crises. The association between banking activities and sustainable performance has been observed since the 1990s when banks began integrating

environmental requirements via their operational activities and offering sustainable products and services.

Therefore, sustainable performance of banks is largely being incorporated into the financial sectors of Pakistan to achieve a competitive advantage. Sustainable performance of banks incorporates the development of strategic plans and execution of business activities and banking operations while considering the social, governance, and environmental impact (Nosratabadi et al., 2020). Different factors are also found to impact the sustainable performance of the banking sector. For instance, Torre Olmo et al. (2021) stated that sustainable performance of banks help increases profitability. However, higher cost-scale efficiency levels result in enhanced profitability within the context of both conventional and sustainable banks. Therefore, sustainable banks are considered vital for developing a healthy financial system in a country.

Moreover, the inefficiency of traditional banks positively impacts the banking system's sustainable performance. Prior studies such as Nepomuceno et al. (2020) focusing on the issues related to bank efficiency, often integrate "data envelopment analysis" (DEA), which is used for determining the associated efficiency of the "peer decision-making units" (DMUs), including multiple outputs and inputs, stating the significance of bank efficiency in influencing sustainable performance. Past research studies have largely focused on the influence of bank efficiency on sustainable performance (Dimitras et al., 2018; Janoudi, 2014; Sharma, 2018; Spong et al., 1995; Sufian, 2016). Besides bank efficiency, there is a need to explore more variables for measuring sustainable performance to get a complete picture of banks. Banks' performance is an important issue and needs to be addressed. The knowledge of banks' performance needs to be completed, and novelty in the banking sector sustainable performance needs to be improved (de Abreu et al., 2019). Risk management

capability is another factor that impacts the banks' sustainable performance. According to Rehman et al. (2021), the agency conflict between the managers and the associated shareholders largely influences the risk management behavior of the firm. Thus, in the case of sustainable performance of a banking system, incorporating an effective risk management system is considered crucial to achieving the desired outcomes. Moreover, macro factors such as inflation and interest rate influence the market risk and encourage sustainable banks to incorporate an effective risk management system (Huy et al., 2021).

The growth in the modern economy is directly linked to the performance of banks; similarly, the economic situation of developing countries is also dependent on the sustainable performance of banks (Duygun et al., 2015; Janoudi, 2014). An efficient and reliable banking sector achieves three goals: maintaining adequate funds to provide loans to the borrowers, providing superior quality customer services, and providing reasonably good profit (Al-Homaidi et al., 2018). The literature suggests that banking sector performance-related studies mainly focus on American and European countries, and there needs to be more focus on developing countries and emerging economies of Asia (Yu, 2017). Therefore, Bătae et al. (2020) also utilized an “economic, social and governance” (ESG) model to determine the financial performance of the banking system, stating that the sustainable performance of a bank helps in improving its financial performance. The productivity of banking sector-related research is very low: the performance of banks is still not a well-defined research area, and the research studies have a great degree of dispersion (de Abreu et al., 2019). The prominent researchers of modern times believe in introducing novelty in banking sector studies in developing countries' economies (Brooks & Schopohl, 2018; de Abreu et al., 2019; Duygun et al., 2015; Yu, 2017). The knowledge of banks' performance is not complete, and

apart from banks' efficiency, other variables may also be explored that can supplement bank efficiency, resulting in overall bank performance.

De Abreu et al. (2019) find that the research studies have a high degree of dispersion, and the focus of renowned researchers on the banking sector got little attention compared with other finance and economics topics. The three-star rated journals and Journal of Distinction (JOD) are not attracting the researchers' focus for banking sector sustainable performance studies (Brooks & Schopohl, 2018). de Abreu et al. (2019) state that studies related to banking sector performance still need to be a well-defined area of knowledge. There is a scarcity of introducing new variables for the banking sector's sustainable performance, and an abundance of replication of studies has been found in the literature. The prominent journals have not focused on the banking sector's performance-related studies. Renowned scholars suggest undertaking innovative studies in developing countries' banking sectors (Brooks & Schopohl, 2018; de Abreu et al., 2019; Yu, 2017).

Another important aspect is identifying the main issues in the banking sector's sustainable performance evaluation procedures. Current performance measurement variables do not present a holistic picture of banks' performance (de Abreu et al., 2019). The present measurement process needs to be improved, and existing variables must give an accurate picture of banks. Usually, people take a single approach; one angle does not consider a holistic picture, and incorporating variables from other disciplines is a better performance measure. However, the influence of essential external factors such as interest rate, inflation, external rate, and GDP on the sustainable performance of a banking system remains limited, which has inspired the present study to focus on these factors within the context of the sustainable performance of banks in Pakistan.

1.1.1 Overview of the Pakistani Banking Sector

Pakistan gained independence from Britain on 14 August 1947 and owned only one bank, i.e., Habib Bank at that time (Bank, 2021). The State Bank of Pakistan (SBP) was established in 1948, and SBP is the central bank (StateBank, n.d.). Currently, 32 banks operate in Pakistan (SBP, 2021). Details of Pakistani Banks are shown in the Appendix- I table. There are different types and numbers of banks that are regulated by the SBP; The number of commercial banks in Pakistan as per different types of regulation are five public banks, twenty private banks, and five foreign banks. Different categories of banks are shown in Table 1.1 (StateBank, n.d.). Details of these categories of Banks are shown in Appendix- II.

Table 1.1: Different Categories of Banks in Pakistan

Banking Sector Overview		
A	1. Private Sector	20
	2. Foreign Banks	4
	3. Public Banks	5
B	Specialized Banks	3
Total Scheduled Banks (A + B)		32

Source: (State Bank of Pakistan, 2021)

The Pakistani banking sector has passed through ups and downs in the last seven decades since independence due to frequent policy changes. The banking sector witnessed growth due to the privatization of banks due to reforms in the banking sector between 1991

and 1997. The financial sector reforms resulted in the emergence of private banks, a change in ownership, and a decline in the share of public banks. According to Rehman and Raoof (2010), Pakistan's banking sector's financial performance was largely influenced by political influence and a waving-off of 75 % of loans. A substantial amount of loans were written off or forgiven in accordance with the political influence. It exerted a serious influence on the financial health and sustainable performance of the banking sectors. Consequently, a reduced efficiency and profitability was observed along with increased non-performing loans, and other challenges in maintaining sound practices of risk management. However, political interference in the financial matters can also undermine sustainable performance of banks. As a result, the ability to contribute effectively towards the country's economic development was also influenced. At the same time, other factors such as overstaffing, private sector politicization, the decline in savings vis-à-vis growth, the opening of more branches, and resource wastage (Bukhari et al., 2020), have also impacted the sustainable performance of the banks, leading to inadequate outcomes. As a result, less growth, poor profitability, and inefficiency have been observed in the sustainable banking system of Pakistan.

In 2018, the banking sector's performance in Pakistan was badly affected due to money laundering and fake accounts, resulting in the check and balance by the international watchdog, the Financial Action Task Force (FATF) (Mukhtar, 2018). Within this context, fake accounts are called fraudulent accounts, which organizations or individuals formulate to deceive banks for personal interests. These accounts are also used for different illegal activities, such as money laundering, which includes disguising financial assets to be utilized without detecting the illegal activity conducted to attain them. Therefore, the persistently increasing number of fake accounts leading to money laundering in the Pakistani banking sector has negatively impacted the social image of the associated banks, preventing many

investors and shareholders from making important investments (Habib et al., 2020). Moreover, this has also impacted the financial stability of the banking sector, resulting in ineffective outcomes within the context of the country's GDP. According to Friedman (1970), banking is a system utilized for the effective allocation of investments and savings; therefore, fraud accounts can largely impact the overall performance of this system, resulting in insignificant outcomes. The main attributes of the Pakistani banking sector decline include inefficiency, less innovation in the research, soaring tax rates, poor risk management, asset ownership issues, non-diversification, and poor customer service (Rehman & Raoof, 2010). Therefore, there is an urgent need to promote effective governance in the banking system of Pakistan to promote sustainable performance.

Table 1.2 describes the deposit natures of the scheduled banks registered with the State Bank of Pakistan, and the table displays the data between 2016 and 2020. According to “Pakistan Credit Rating Agency” (PACRA, 2021), the total deposits, GDP, and GDP ratio against deposits remained highest in 2020. It has been lowest in 2016, so the Bank deposit from 2016 to 2020 is increasing. It has increased from 14 % to 60% in five years, which shows that the banks in Pakistan are growing in their profitability, efficiency, and risk management capability. The highest GDP was PKR 33,878 in 2020, while in 2016, it was PKR 27,4402. The five-year analysis shows that the deposit-to-GDP ratio of Pakistani scheduled banks was 43% in 2016, and with the increasing rate, it was 48% in 2020; there has also been an adequate increase in the deposit-to-GDP ratio (PACRA, 2021). Therefore, the banks must manage their liquidity and capital levels to overcome the losses and fulfill the customers' withdrawal demands (Boubakri et al., 2019). However, a lack of effective liquidity management can hinder the capability of the banks to lend, influencing the country's

GDP. Another issue usually faced with increased deposits is the lack of transparency (Chen et al., 2022), which might also impact the risk management system of the banks.

Table 1.2: Scheduled Banks Deposit Analysis

Scheduled Banks (PKR billion)	2016	2017	2018	2019	2020
Total Deposits	11,798	13,011	14,254	15,953	18,519
GDP (FY)	27,402	29,978	32,383	35,783	38,878
Deposit to GDP Ratio	43%	43%	44%	45%	48%
Growth	14%	10%	10%	12%	16%
Average PKR depreciation (FY)	3%	0%	5%	24%	16%

Source: (PACRA, 2021)

The trends of customer deposits, financial institutions, and local and foreign currency deposits are shown in Figure 1.1 (PACRA, 2021). According to PACRA (2021), customer deposits have increased from 14 % to 17 %, with a decreasing trend in 2018. At the same time, financial institutions have decreased their growth from 2017 to 2018. The increasing trend was shown in 2019 up to 26 % and again declined in 2020 to 15%. The local currency deposit decreased from 2017 to 2019 and increased in 2020. In contrast, foreign currency deposits are increasing from 2017 to 2019, with an average increase of 15 %. A decreasing trend is visible from 2019 to 2020 (PACRA, 2021).

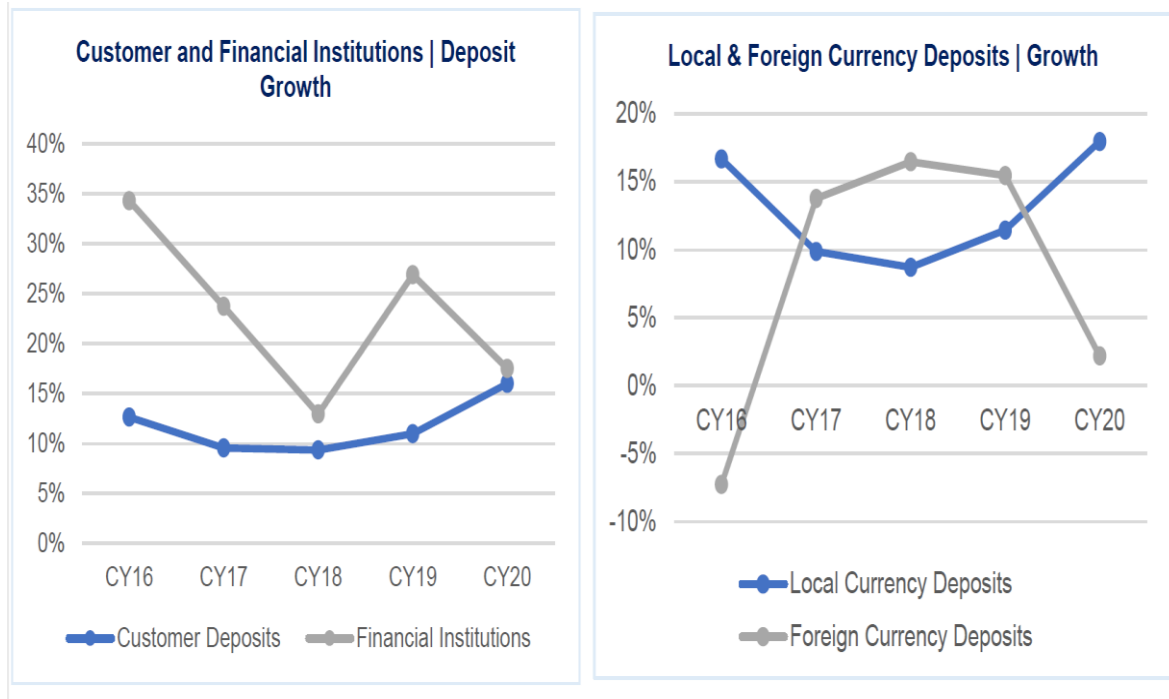


Figure 1.1: Customer and Financial Institution Deposits Versus Local and Foreign Deposits

Source: (PACRA, 2021)

1.1.2 Latest Trends in the Banking Sector in Pakistan

From mid-March to June 2020, the Monetary Policy Committee (MPC) decreased the policy rates from 13.25 percent to 7 percent cumulatively to 625 basis points (PACRA, 2021; SBP, 2021). The promotion of investment and new Balancing, Modernization, and Replacement (BMR) is done by a concessionary refinance of Temporary Economic Refinance Facility (TERF). The SBP's (Debt Relief Scheme) loan Extension and Restructuring Package was announced to facilitate the deferment of borrowers' loans and their restructuring. The Rozgar Scheme of SBP also supports the salaries and wages of workers (daily wagers, permanent employees, outsourced and staff on a contract basis) for

half a year for every category of business barring the Governmental organization, to prevent downsizing (PACRA, 2021; SBP, 2021).

According to PACRA and State Bank, other initiatives have also been taken for Pakistan's banking sector to improve Pakistani banks' sustainable performance. The SBP was given autonomous status through the SBP Amendment Act of 2021, which grants more autonomy to the SBP in terms of appointments, defined policy goals, minimizing political and government interferences, and safeguarding some degree of indemnity for the officials of the SBP from provincial and federal inquiries during suspected wrongdoing. According to Tsindeliani et al. (2022), the digital transformation of the conventional banking system is also essential to improve the sustainable performance of the associated banks. Therefore, to promote digital banking in Pakistan, a draft regulatory framework has been issued, and this framework incorporates guidance for supplementary regulations and licensing for digital banks. This framework sets constitution models, different licenses for the digital bank, and minimum criteria of eligibility and competencies for CEOs, directors, and sponsors. After a positive reaction in September 2020, Roshan Digital Account for remittance of diaspora, Roshan Samaaji Khidmat, and Roshan Apni Car were launched by the Pakistani banking sector under the patronage of the central bank (PACRA, 2021).

According to PACRA and State Bank, the first instant payment system in Pakistan, the Raast permits end-to-end digital payments among government entities, businesses, and individuals, contributing to the sustainable performance of the banking system. Raast state-of-the-art faster payment system introduced in the Pakistani banking sector that utilizes real-time to resolve small value retail payments while giving universal and affordable access to all financial industry stakeholders, including financial technology (fintech) and banks. For the facilitation of business for consumer e-commerce exports, a regulatory framework has

been issued by SBP. Previously, the 'Export' (E) form was mandatory for export, and now, with the introduction of this framework, an export of USD 5,000 per shipment is allowed with no prerequisite for the 'E' Form (PACRA, 2021).

Therefore, the contribution of digital technology in improving sustainable banking in Pakistan has largely been discussed in past studies. However, limited focus has been given to different internal factors such as risk management capability, profitability, and efficiency within the context of sustainable performance of the banking system within the context of Pakistan. At the same time, the contribution of different macro elements or external factors such as interest rate, inflation, and GDP to sustainable banking also needs to be discussed within the context of the banking system of Pakistan, creating a void in past literature. Therefore, the present study has been effective in filling this research gap.

1.2 Problem Statement

In the modern era, the sustainable banking sector is the backbone of a country's economy. Because sustainable banks are well-reputed, they give their investors and customers confidence. They attract more customers to increase profitability (Bussoli et al., 2019). These banks remain profitable and attract clients by using different characteristics: efficiency that is achieved through various business cultures, less risk, or environmental and social values (Aramburu & Pescador, 2019). Therefore, different external and internal factors influence the sustainable performance of banks. Sustainable plans can decrease insolvency risk as these contribute to image building and attracting customers, lowering the reputational risk (Ruiz et al., 2016). Developed countries such as Japan, the UK, and the USA have largely incorporated technical efficiency and risk management systems in their sustainable banks, which have helped them to become the greatest economic powers in the

world. However, different developing countries are also taking important steps towards promoting sustainable banking to improve their economic growth.

Nonetheless, with the introduction of new reform in 1991, the privatization status of banks was restored, and banking sector performance is moving in a positive direction, contributing to sustainable banking in Pakistan. However, sustainable performance is badly affected in the Pakistani banking sector due to different contributing factors such as risk management inefficiency, less profitability, and the risk of being unstable due to insolvency and bankruptcy. All private Pakistani banks were nationalized in 1974, paving the way for political intervention, borrowing from banks to meet fiscal deficits, and waving bank loans. These factors contributed negatively to sustainable banking in Pakistan (Rehman & Raoof, 2010). Moreover, the persistent increase in inflation and interest rates in Pakistan has negatively impacted sustainable banking. Increased interest rates result in enhanced borrowing costs, which reduce the sustainable banks' budget to invest in renewable energy resources. However, with the increase in inflation rates, sustainable banks are also unable to provide loans and investments, impacting the overall sustainable growth of Pakistan.

Therefore, the lack of sustainable banking might also negatively impact a country's economy. As a result of this, the development of fake accounts and other illegal activities have increased in the banking sector of Pakistan, damaging the reputation of the banking sector in Pakistan and negatively influencing the confidence of customers and investors, resulting in less profitability and inefficiency. Similarly, all the essential variables; efficiency, profitability, risk management capability, and external and internal factors are not incorporated. In that case, overall sustainable performance results may not accurately represent the banking sector. Non-incorporation of these variables leads to mismanagement

and inefficiency because the management of banks may only be able to safeguard against declining sustain if analyzing essential variables of efficiency, profitability, and risk management capability. Another consequence could be that the banking sector's growth can be at stake in the absence of profitability, and the banks may become prone to insolvency and bankruptcy. Therefore, this may increase insolvency risks, contributing to the declining attraction of customers and increasing reputational risk. Due to a lack of sustainable performance in the banking sector, the developing countries' economies are shrinking. Moreover, the sustainable performance of the banking sector cannot be gauged by either one odd variable as most researchers only measure the efficiency of banks and miss other important variables of profitability and risk management capability in one conclusive study. Hence, we can state that the sustainable performance of the banking sector cannot be confined to only one odd variable; instead, its performance is an integration of findings of different factors of the wide range of variables that are chosen from the discipline of Finance, Accounting, and Economics, that contribute in evaluating the sustainable performance of banks.

The continuous integration of sustainable banking has encouraged researchers to focus on the influence of various internal and external factors on the sustainable performance of the banking system. Different authors have tested the relationship of various variables with sustainable performance. A study was conducted by Hassan (2006) on 21 Muslim countries' banking sectors, covering 43 banks from 1995 to 2001. Return on asset (ROA) and return on equity (ROE) have been incorporated in this research to determine banks' efficiency; however, this did not incorporate net interest margin (NIM). A study on 44 Islamic banks was conducted for the GCC region by Smaoui and Salah (2012) from 1995 to

2009 to analyze profitability determinants. This study suggests that ROA NIM and ROE are the main profitability indicators, and profits result from better asset quality and capital.

In contrast, GDP and inflation were used as external variables, which have a significant and positive relationship with the sustainable performance of banks. A study conducted by Schaeck and Cihák (2014) about 10 European countries used data from 1995 to 2005, focusing on capital ratios. The results prove that the larger banks' capital was reduced compared to small banks, and the capital of smaller banks increased. Furthermore, more capitalization was found in old banks and less in new banks. Finally, capitalization was increased in the countries with higher GDPs.

Nemours' research has been undertaken to determine the relationship between profitability and the sustainable performance of banks; however, the relationship between banks' stability and sustainable performance could not get sufficient attention from researchers (Saïdane & Abdallah, 2020). Researchers in developing countries target efficiency, profitability, and risk management capability individually and rarely analyze the impact of all these variables on sustainable performance in one unison study. Therefore, this is the main problem leading to this study's conduct.

This issue is essential and is being discussed by researchers around the world. That is why the researcher has targeted the banking sectors of a developing country, i.e., the Pakistani banking sector. However, unfortunately, very little research is available on the Pakistani banking sector. Most banking research focused on developed countries, and limited scholars replicated the studies of American and European for developing countries (Alharthi, 2016; Kamarudin et al., 2019). Studies on banking efficiency, profitability, and risk management capability in Pakistan must be better defined. According to the author's best knowledge, very few banks' performances and sustainable performance of related studies are

available in Pakistani literature; moreover, the author could not find a study that measured the impact of profitability, risk management capability, and efficiency on sustainable performance in one unison study. Although the Pakistani researcher has replicated studies of developing countries, the focus remained on previously recognized variables, and fresh contribution in the Pakistani literature is rare.

According to contingency theory, an organization's sustainable performance cannot be measured by one odd standard process; therefore, the efficiency and characteristics of an organization are influenced by specific and contextual characteristics (Ong et al., 2019). Organizational performance is also affected by ownership structure, size, external environment, organizational structure, and strategy. The contingency theory is a management theory and does not focus on a "one-size-fits-all" approach within the context of organizational management (Du & Kim, 2021). Therefore, within the context of this theory, different internal and external factors can influence the banks' sustainable performance. For instance, efficiency in banks is considered to play a vital role in dealing with economic fluctuations and achieving competitive advantage. Risk management and profitability are also found to contribute to the sustainable performance of the banks (Kumar & Prakash, 2019).

Moreover, other external factors such as exchange rate, interest rate, GDP, and inflation are also crucial in influencing the sustainable performance of the banking system. The ESG model has also effectively determined different aspects of sustainable banking. For instance, income inequality influences equal opportunities for customers; therefore, the social aspect of the ESG model helps promote income inclusion, leading to sustainable banking (Úbeda et al., 2022). Similarly, an effective governance model incorporated in sustainable banking is essential to prevent agency conflicts, whereas environmental policies

help improve the banking system's sustainable performance. Therefore, according to FATF, Pakistan's banking system is largely impacted by illegal activities; therefore, incorporating these factors can effectively promote sustainable banking in Pakistan, leading to effective outcomes.

A few studies in the context of the banking sector measure the sustainable performance of banks in advanced countries, mostly the USA and Europe, got the focus of renowned scholars. Sustainable performance-related studies for the banking sector in developing countries are scarce. According to the best knowledge of the researcher, only limited studies have been conducted about sustainable performance issues in Pakistani organizations. Mainly, in the context of the banking sector, ineffective research studies have been conducted in Pakistan. Therefore, the sustainable performance of banks in Pakistan is the ignored sector, which is why the researcher has chosen the banking sector for the thesis. The banking system is crucial for the economic growth of the country; therefore, the improvement in the sustainable performance of banks is essential to improve the overall GDP of the country. Therefore, this is a practical study for Pakistan. Besides upheavals in Pakistan's economy, Pakistan's banking sector played a vital role in the country's economy. All the financial institution of Pakistan has a well-defined role in financial intermediation; however, the banking sector of Pakistan is predominantly playing a significant role in this field (Ali, 2012). The last two decades witnessed considerable growth and improvement in the banking sector of Pakistan. However, conclusive studies related to banking sector performance in Pakistan are scarce.

Against the backdrop of the above discussion, there is an urgent need to conduct a research study about the Pakistan banking sector's sustainable performance by developing a comprehensive bank performance framework (BPF) based on relevant literature and

empirically collecting and testing the said framework. That is why this study has been conducted to combine the impact of efficiency, profitability, and risk management capability on the sustainable performance of Pakistan. Similarly, the relationship between internal and external determinants and sustainable performance has been investigated.

1.3 Objectives of the Study

The objectives of this research are to empirically determine the sustainable performance of banks in Pakistan as under:

1.3.1 General Objective

- i. To develop a framework for the investigation of banks' sustainable performance in Pakistan from the internal and external perspectives.

1.3.2 Specific Objectives

- i. To assess the impact of internal factors (efficiency, profitability, and risk management capability) on the sustainable performance of banks in Pakistan;
- ii. To analyze the impact of external factors (GDP, inflation, interest rate, and exchange rate) on the sustainable performance of banks in Pakistan.

1.4 Research Questions

In the sequence to the research problems highlighted in the said research, the following research questions have been designed to achieve the objectives of the study:

- i. What is impact of different factors on overall sustainable performance of banks in Pakistan?
- ii. What is the impact of internal factors (efficiency, profitability, and risk management capability) on the sustainable performance of banks in Pakistan?

- iii. What is the impact of external factors (GDP, inflation, interest rate, and exchange rate) on the sustainable performance of banks in Pakistan?

1.5 Scope of the Research

The study focuses on the sustainable banking sector performance in Pakistan, a developing country. Pakistan is emerging as a big economy due to the peace accord in Afghanistan on February 29, 2020, and China Pakistan Economic Corridor (CPEC) dividends. Presently, 32 banks are operating in Pakistan. This study includes five years of data from all banks in Pakistan from 2016 to 2020. The banking sector is divided into public (owned by the government), private (commercial), and foreign banks operating in Pakistan.

This research focuses on the impact of three internal factors, efficiency, profitability, and risk management capability, on banks' sustainable performance, which is the dependent variable. Similarly, the impact of the external and bank-specific variable on the sustainable performance of banks have been analyzed. These banks' specific internal and external variables have rarely been used to assess the combined effect of these determinants on the sustainable performance of banks. These three variables are significant subjects of banking sector studies, and researchers in the past have conducted an independent thesis on each one of these variables.

When we measure the effects of banks' specific internal and external determinants on sustainable performance, the scope of this research becomes very large and challenging, demanding the processing of massive data and a complex long list of calculations to reach the final product of sustainable performance. This new approach covers all the neglected aspects of previous studies and integrates different disciplines into one product.

1.6 Significance of Research

This research is designed about the current issue of sustainable performance in the banking sector in general, particularly in Pakistan. The impact of efficiency, profitability, and risk management capability with corresponding banks' specific and external determinants have been studied to examine the sustainable performance of banks. This research has the following contributions.

1.6.1 Theoretical Contribution

This research is the first kind in the banking sector literature that integrates all essential subjects, such as efficiency, profitability, risk management capability, GDP, inflation, interest rates, and exchange rates, in one study. In one study, the current study measures the impact of banks' specific internal and external determinants on sustainable performance. Banks' performance framework adds to the knowledge of banking sector literature. The complete picture of banks, ranging from efficiency, profitability, and risk management, with corresponding banks' specific internal and external determinants, can assist the management of banks in enhancing efficiency, maximizing profitability, averting risk, and achieving sustainable performance.

Sustainable studies are scarce in the finance literature, and these are mostly ignored in the banking sector studies, especially in developing countries. This study encompasses the financial, accounting, and economics variables that theoretically contribute to the banking sector and finance studies. Most researchers have predicted that future finance and banking sector studies will be innovative and interdisciplinary because a holistic outcome is impossible under one discipline, especially in the banking sector. This study lays the foundation for the researchers to conduct more studies in the finance and banking sectors.

Furthermore, this study determines the impact of banks' specific internal and external determinants on the sustainable performance of banks in Pakistan. This research is unique and plays a vital role in contributing to the overall banking sector, particularly the Pakistani banking sector, to measure and enhance its sustainable performance. The literature related to the performance of banks independently analyzed the three variables of banks, i.e., efficiency, profitability, risks, and bankruptcy of banks. Studies measuring sustainable banks' performance encompassing all essential variables in one holistic study incorporating economic, finance, and accounting disciplines are limited (Shah et al., 2019). Profitability, efficiency, and risk management capability have yet to be analyzed in a single holistic research in Pakistan to measure Banks' sustainable performance. Similarly, Pakistani literature has yet to study the relationship of these three variables with sustainable performance and the impact of banks' specific and external determinants on sustainable performance.

1.6.2 Methodological Contribution

Most studies measured efficiency, profitability, and risk management capability separately and independently. The methodology of combining these essential subjects in one conceptual framework remained ignored in the methodology of the banking sector framework. Therefore, for the present study, an effective conceptual framework has been developed that incorporates the impact of different internal and external factors on the sustainable performance of the banking system in Pakistan.

1.6.3 Practical Contribution

Innovative studies related to Pakistani banking sectors are scarce. Banks face looming threats of FATF, inefficiency, various risks, and less profitability. This holistic

study is the first to focus on efficiency, profitability, and risk management capability in one study. This research benefits policymakers, management, and investors of Pakistan to assess the sustainable performance of banks in Pakistan, and the same performance variables can be utilized by banking sector management in other countries. A complete picture of banks, ranging from efficiency, profitability, risk management, and external factors, can assist the management of banks in achieving sustainable banking.

The government and senior management of Pakistani banks can take safeguards as demanded by FATF in the light of the results of recommendations of this study for measuring the sustainable performance of banks to curb fake accounts, money laundering, risks, and misappropriations.

1.6.4 Social Contribution

This study can assist the banking sector management in measuring the sustainable performance of banks. The management can focus on grey areas and enhance the sustainable performance of banks. The banks are the backbone of a country's economy, and through sustainable performance, these banks can pave the way for overall sustainable growth in a country's economy. Banks' sustainable performance enhances investors' and customers' confidence in the banking sector. This study can be helpful in decision-making for investors. The sustainable performance of banks may also boost other sectors of Pakistan, for example, education, health, industry, construction, and tourism, resulting in society's overall well-being.

According to Akomea-Frimpong et al. (2022), sustainable banks incorporate green finance policies that effectively promote climate change and environmental policies, social inclusion, social justice, banking regulations, and interest rates. Thus, the present study can

also effectively encourage sustainable banks to promote social inclusion without discrimination.

1.7 Organization of Thesis

This research dissertation consists of five chapters. **Chapter 1** aims to introduce the whole research process adopted by the researcher. Chapter One includes the background, the problem statement, the research objectives and questions, the study's contribution, the study's scope, and the study's organization. **Chapter 2** aims to review prior studies, design the framework, and draw hypotheses for this research. Chapter Two provides literature reviews on sustainable performance, efficiency, profitability, and risk management. The literature on internal factors such as loan intensity, bank size, financial leverage, and credit risk are studied. Past studies on external variables such as inflation, Gross Domestic Product (GDP), exchange rate, and interest rate have been researched. Relational literature to study the relationship among different variables has also been reviewed. Research framework identified and research gap diagnosed.

Chapter 3 aims to introduce all the research methodology. The research process adopted by renowned scholars has been researched. The research philosophy adopted by the researcher has been written. The research approaches encompassing deductive and inductive research approaches have been studied. The principles of positivism and objectivism have been researched. The quantitative methodology has been used for the present research. The research strategy adopted for the present study has been written. The details of survey research are focussed in the chapter. Based on the objectives and research questions of the study, the research design has been identified. The details related to the research population and research sampling were pinned down. The data collection methods have been focussed.

The data analysis techniques and software to be used for analysis are explored. The econometric model equation has been finalized to calculate the sustainable performance of banks. The measurement proxies for all dependent and independent variables have been shortlisted. The ethical considerations for the research are written at the end of this chapter.

The purpose of **Chapter 4** is to describe the results. In this chapter, the results of 32 banks in Pakistan are calculated, and analyses are drawn for each variable. Efficiency, profitability, and risk management capability results are measured, and their impact on sustainable performance is analyzed. Sustainable performance is measured by return on assets (ROA), social performance, and environmental performance. The bank's efficiency has been measured through technical efficiency (TE), pure technical efficiency (PTE), and scale efficiency (SE) through data envelopment analysis (DEA). The profitability has been measured through net interest margin (NIM) and returns on equity (ROE). The risk management capability has been measured by capital ratio and z-score. The impact of the external factors on sustainable performance has been measured. In the end, the impact of internal factors on the sustainable performance of banks has been examined. Then, the overall impact of efficiency, profitability, risk management capability, and external factors is calculated for the banks' sustainable performance.

The purpose of **Chapter 5** is to conclude the study. This chapter consists of discussions, a summary of the study's limitations, and recommendations for future research. The results related to the impact of efficiency on sustainable performance, the impact of profitability on sustainable performance, the impact of risk management capability on sustainable performance of banks, the impact of external factors on sustainable performance of banks, and the impact of internal factors on sustainable performance of banks have been

summarized. The relation of each objective with the results calculated in chapter four has been discussed in this chapter to draw the relevant conclusion for achieving the study's objective. The research implications of the present study have been summarized. The limitations of this study have been identified, and based on these limitations, practical recommendations are proffered for future studies by researchers interested in researching the topic of banks' sustainable performance.

1.8 Chapter Summary

Chapter 1 presented the background of the banking sector and an overview of the Pakistani banking sector. The problem statement gave a brief account of the main issues necessitating the need to conduct this study. Then, the five objectives of the study were discussed. The scope of this research is discussed. The significance of the research covers the contribution of this research. In the end, the organization of the thesis is described. The next chapter is the literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This chapter reviews prior studies to develop this research's framework and formulate the hypothesis accordingly. The previous studies conducted on the variables: sustainable performance, efficiency, profitability, and risk management in the USA, Europe, and many other developing countries, have been explored to formulate the research hypotheses following the literature reviewed. During the literature review, the researcher also focused on the context of underpinning theories such as banking theory and contingency theory. The researcher has also gone through all the available studies in relational literature to find a relation between efficiency and the sustainable performance of banks; profitability and the sustainable performance of banks; and risk management capability and the sustainable performance of banks. Similarly, the literature on the relationship of external and internal determinants with the sustainable performance of banks has also been reviewed. Literature regarding each variable as internal, external, control, and dependent variable has been reviewed to yield beneficial insights following the previous studies on these variables.

2.2 Sustainable Performance of Banks

The sustainable performance of banks can be defined as integrating sustainability into banking activities, which has become increasingly essential. At the same time, it has become an extremely challenging issue faced by banking institutions (Özçelik & AVCI ÖZTÜRK, 2014). According to the research by Galletta et al. (2022), this integration has taken two forms predominantly: environmentally and socially responsible initiatives (for example, recycling programs, assistance against cultural events, charitable donations, and

improvement practices regarding energy efficiency). The second integration is related to the social and environmental considerations in mission and business strategies and product designs (for example, the environmental and integration criteria into lending and investment policies). Therefore, the sustainable performance of banks is beneficial in many ways for the institution and the environment. Taking measures that eliminate environmental degradation, save resources, improve energy efficiency, and give value to stakeholders and customers is beneficial for any financial institution's monetary and non-monetary gains. Because being focused on environmentally responsible behavior increases customer satisfaction levels (as the bank is recognized as a responsible financial institute concerned with the well-being of the environment) (Gunawan et al., 2022). Similar to other organizational or industrial sectors, the sustainable performance of banks also deals with the harmonization of financial objectives and environmental obligations in delivering key business activities for value maximization. Therefore, sustainable performance in the banking sector involves creating such systems, policies, and strategies that ensure a healthy balance between an institution's present profitability and continued viability and profit over a long period. Furthermore, the research by Nizam et al. (2019) highlighted that the sustainable performance of banks encompasses the assurance that whichever practices are adopted by a banker bear no or very little negative environmental impact on the future industry. Figure 2.3 shows the application of the banking sector's Environmental, social, and governance models.

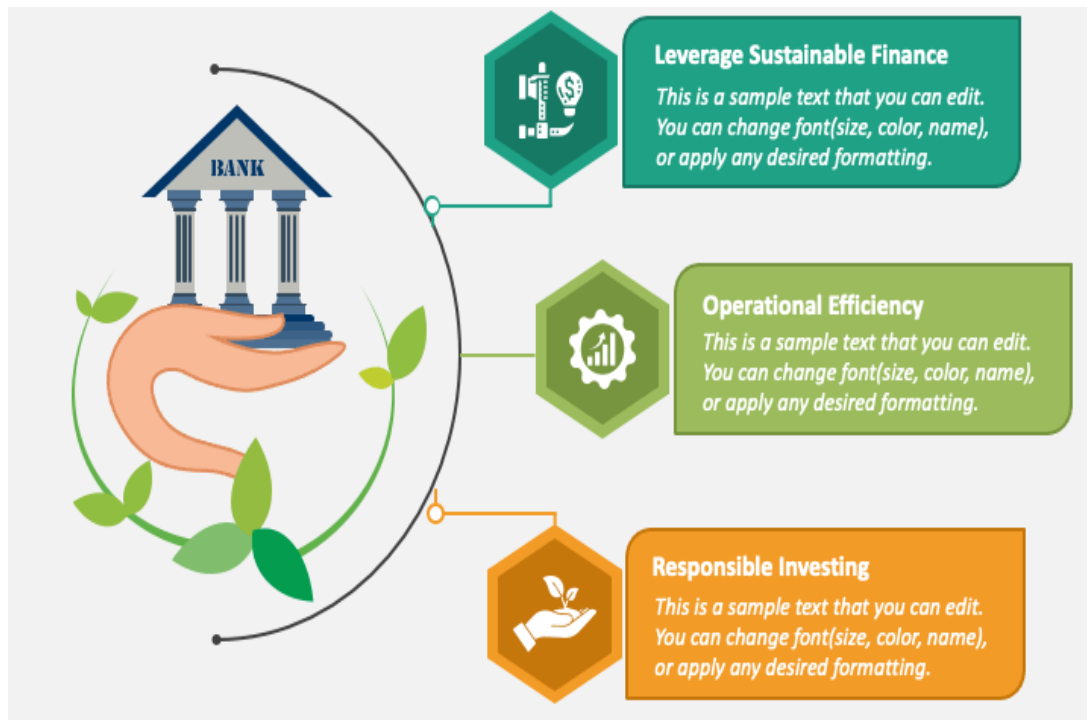


Figure 2.1: ESG Model in the Banking Sector.

Source: Bubble, 2023

"Sustainability is an integrative, holistic and long-term approach that advocates a balance between economic, social and ecological dimensions of business, making companies responsible not only for monetary short-term goals but also for people and the planet" (Bedenik, 2018, p.3). Zheng et al. (2021) reviewed 227 research publications spread over 48 territories/countries and found that developed countries such as the United States, Italy, China, and Australia are studying the concepts of sustainable performance, sustainable development, corporate sustainability, corporate social performance, and corporate finance. This highlighted the need and importance of studying "sustainable performance" in Pakistani Banks as many researchers are currently focusing on the requirement to promote and explore the sustainable performance of organizations in developing countries. The research is also gaining momentum in Turkey, South Korea, Brazil, and Vietnam. However, developing

countries and emerging markets have incomplete financial systems that need sustainable performance improvements.

Sustainable performance encompasses an organization's performance in three fields: environmental, economic, and social (Ali et al., 2019). According to Brundtland (1987), sustainable performance is the economic development activity that meets the requirements of today's generations without affecting the opportunities and capacities of future generations. All the stakeholders expect sustainable banks to participate in the evaluation reports process (Young & Tilley, 2006). The stakeholders assess the sustainable performance of banks through annual reports providing relevant information and data related to banks' sustainable performance (Stauropoulou & Sardianou, 2019). Integration of sustainable performance to process, strategy, services, and product help in achieving a new banking strategy, and this sustainable performance is a value driver for customers' needs and public mission (Weber, 2005).

In financial performance, the relationship between sustainable development and the banking sector remained the focus of scholars (Aras et al., 2018). The stakeholders are interested in sustainable banking that assists stakeholders in the performance evaluation of the banking sector (Rebai et al., 2012).

2.3 Research Gap

Banking sector literature review of the USA, South American countries, Europe, Africa, Middle East, South Asia, China, Australia, and Southeast Asian countries of the last two decades have been reviewed to identify research gap for the conduct of an innovative study on measuring the sustainable performance of banks. Sustainable performance and development emerged recently and provided a platform for sustainable improvement in

organizations (Tampakoudis, 2013). Researchers and scientists have not suggested different banking theories in the last 300-500 years or even disagreed with the existing banking theories (Werner, 2016). However, finding a new theory is different from the mandate of this thesis. Research studies have independently analyzed the relationship between variables of efficiency, profitability, risk management capability, and external determinants with sustainable performance (Zheng et al., 2021); however, according to the best knowledge of the researcher, the holistic impact of all these variables on the sustainable performance of banks have been rarely found in the literature.

Similarly, the Pakistani banking sector literature must include this holistic research on measuring sustainable performance through internal factors (efficiency, profitability, risk management capability) and external factors (GDP, inflation, interest rate, and exchange rate). The impact these factors on sustainable performance has been studied independently. Its relationship in unison study has been rarely found with sustainable performance, especially in the contextual literature of the Pakistani Banking Sector.

According to the best of the researcher's knowledge, this study is the first of its kind in the context of the Pakistani banking sector and would contribute to the existing literature related to the banking sector literature. The present thesis bridges a serious gap in the literature on the sustainable performance of banks in Pakistan. Furthermore, the current study extends, contributes, and builds on the work of (Khan et al., 2015; Alharthi, 2016; and Al-Homaidi et al., 2018), who ignored the effect of efficiency, profitability, and risk management capability, GDP, inflation, interest rate, the exchange rate on the sustainable performance of banks. Alharthi (2016) explored the impact of banks' specific internal and external factors on banks' efficiency, profitability, and stability; however, the authors still need to take a holistic view by constructing a framework that examines the sustainable

performance of banks through all these variables. These researchers have not analyzed the relationship between external determinants and the sustainable performance of banks.

2.4 Internal Factors and Sustainable Performance

The study by Nsambu (2014) used internal factors such as bank liquidity, capital adequacy, bank size, cost efficiency, management efficiency, goodwill, interest income and cost inefficiency. Therefore, efficiency, profitability, and risk management factors are considered potential internal factors to assess the sustainable performance of a bank. A similar study by Zaman (2011) also analyzed the determinants of a bank's profitability in Pakistan by considering internal factors. Domanović et al. (2018) also studied bank profitability as an internal factor to assess the bank performance in Serbia. Huy et al. (2021) also studied the risk management culture for sustainable growth and performance of Asian banks.

Similarly, research by Alim et al. (2021) also analyzed the influence of liquidity risk management on the financial performance of commercial banks in Pakistan. From these studies, numerous factors, such as risk management, efficiency, and profitability, influence the performance of banks. Therefore, by assessing these factors, the sustainable performance of banks can be evaluated and analyzed efficiently.

2.4.1 Bank's Efficiency (Internal Factor)

Efficiency is the measure of efficacy that gives the lowest waste of effort, skill, and time (Alber et al., 2019). In economics, efficiency means achieving the maximum ratio between output and input during product development, necessitating the best resource distribution to achieve maximum potential. Efficiency in economics is defined as the maximum ratio between the input and output of the product development procedures, which illustrates the ideal distribution of

available resources to achieve the maximum potential (Cvilikas & Jurkonyte-Dumbliauskiene, 2016). The efficiency of the banking sector means efficient implementation of external policies by generating sustainable developments, social welfare, and economic growth, ensuring profit maximization and cost minimization (Pereira & Marques, 2021). In the present study, the efficiency of banks has been considered an internal factor, and its influence on the sustainable performance of banks has been assessed. The reason for efficiency to be selected as an internal variable is that it measures how much a bank or any other financial institution turns its expenses into revenues. This is the internal capability of a bank to how efficiently it utilizes or conducts its operations to yield maximum benefit and sustainable performance. The research by (Sathye, 2003; Umar et al. 2021; Wang et al., 2021) also discussed the productive efficiency of banks in different developing countries. According to Shah et al. (2019), external factors influence sustainable banks, and internal factors influence non-sustainable banks. Orazalin et al. (2019) included size, age, leverage, and financial capacity as control variables affecting sustainable and financial performance.

Edgeworth (1881) and Pareto (1927) gave the efficiency concept as a performance indicator for all businesses. Shephard (1953) recorded the empirical application of efficiency as a performance indicator in his book "Cost and Production Functions." The efficiency measurement enables the management and the client to find the individual status of the bank in comparison to other banks. Extensive studies are available on banks' efficiency; however, efficiency studies in developing countries are scarce (Alber et al., 2019). The efficiency measurement enables the management and the client to find the individual status of the bank in comparison to other banks.

Banks are defined as financial intermediation organizations that receive funds from depositors and then lend to borrowers. Similarly, banks perform as production organizations and utilize capital and labor to generate loans and deposits (Abdul-Majid et al., 2011). In the literature, deposits have been utilized as input, and loans are used as the outputs to determine the efficiency of banks; hence, banks use financial intermediation theory to use available resources to generate maximum output (Alharthi, 2016). Efficient banks are essential for the bank's management and clients. Efficient banks provide a better quality of services. Therefore, clients prefer to deal with efficient banks. The banks declare their efficiency in creating awareness among customers and handling a competitive environment.

The research regarding a bank's efficiency is important to measure the bank's performance because efficient banks attract maximum clients. Measures taken to increase the efficiency of banks contribute to addressing the inefficiency or other problems prevailing within banks, which results in more profits with less cost (Alharthi, 2016). Efficiency research assists management in taking care of inefficiency, as only efficient firms and institutions could withstand the global financial crisis 2008 (Otker-Robe & Podpiera, 2013).

Numerous methods exist to understand and address the problem of evaluating financial institutions' efficiency (Mamatzakis et al., 2016). One of the most basic methods is the separation of structural from non-structural approaches (Hughes & Mester, 2008). Another general classification divides studies based on parametric or non-parametric methods (Berger & Humphrey, 1997). These segmentations are interesting when researchers desire to theoretically understand the process of evaluating banking efficiency. Similarly, banking theory has gained new contours, which have modified the studies on banking efficiency. The literature has shifted away from traditional microeconomic theory, moving

towards a modern theory of banking intermediation and the microeconomics of banking production.

The non-parametric Data Envelopment Analysis (DEA) gradually became popular in determining efficiency in the banking systems of developed countries (Grigorian & Manole, 2002). Charnes et al. (1978) were the first to recommend the DEA method to measure the efficiency of banks. Financial Analysis and Data Envelopment Approach (DAE) are used to measure the efficiency of banks (Wozniowska, 2008).

The efficiency concept as a general performance indicator for all types of businesses was first formulated in the early works of Edgeworth (1881) and Jaffé (1972) and recorded its empirical implementation in the book of Shephard (1953). The efficiency measurement enables the management and the client to find the individual status of a bank in comparison to other banks. Extensive studies have been conducted on banks' efficiency in developed countries; however, efficiency studies in developing countries are scarce (Alber et al., 2019).

Maximizing efficiency within banks has been upgraded and improved to a greater extent. So, in the past few years, the research on banks' efficiency has been improved because many banks work to maximize their efficiency and consequently attain output maximization (i.e., profit through minimum input, i.e., minimum expenses) (Alharthi, 2016). Large banks take over the small banks to mitigate risk, raise capital, and reduce competition (Fixler & Zieschang, 1993). The banking sector's efficiency research is useful for investors, shareholders, managers, policymakers, market analysts, and government regulating authorities (Andrieş & Căpraru, 2012). The efficiency of banks got more focus of researchers after the rise of mergers of banks because the merger contributed to increasing the efficiency of banks (Avkiran, 1999).

Efficient banks can generate maximum output by using minimum input that contributes to banks' sustainable performance, and a company's failure or success depends on transforming inputs into outputs (Berger & Humphrey, 1997; Alharthi, 2016). Mostly, bank efficiency as a performance measurement remained the focus of most researchers (Dimitras et al., 2018; Janoudi, 2014; Ruslan et al., 2019; Sharma, 2018; Spong et al., 1995; Sufian, 2016). Extensive studies on efficiency have been conducted; some studies utilized few bank-specific variables, and very few utilized external factors; however, as per the best knowledge of the author, many significant variables have been ignored by the researchers (Casu & Molyneux, 2003; Grigorian & Manole, 2002; Hasan & Marton, 2003; Hassan, 2006; Havrylchyk, 2006; Yudistira, 2004).

2.4.2 Bank's Profitability (Internal Factor)

The profitability of banks assists the policymakers in knowing the financial performance of banks. Profitability means the ability of the business to give a return on investment based on the resources used compared to an alternative investment (Gakono, 2021). The profitability of banks assists the policymakers in knowing about the financial performance of banks. The banks attain profits by charging a fee on services and through interest. The profitability of banks measures the profitability of banks through return on equity (ROE), return on asset (ROA), and net interest margin (NIM) (Ghosh, 2014; Houston et al., 2010).

Similar to the bank's efficiency, the bank's profitability is also considered an "internal factor" in assessing a bank's performance. In the present research, the internal factor of banking profitability has been assessed to analyze its influence on the sustainable performance of banks. Profitable banks are a crucial part of a stabilized financial system in any bank. Furthermore, the research by (El Khoury et al., 2023); and Saeed (2014) also

highlighted that profitability is an important indicator of measuring the performance of banks. Most researchers should have noticed important external and banks' specific internal determinants, which are mandatory to examine profitability (Alharthi, 2016). Many renowned researchers emphasized the importance of profitability as the primary contributing variable in measuring the performance of banks. However, their results suggest that most profitability studies ignored the crucial bank's specific internal and external factors (Chitan, 2012; Pasiouras & Kosmidou, 2007).

Profitable banks are considered the most efficient, stable, and competitive, contributing to the sustainable performance of banks (Apergis, 2014). The bank's specific internal and external variables are profitability determinants (Alharthi, 2016). These determinants of profitability highlight the reasons behind profit or any loss, assisting the bank management in looking for alternative plans in case of any loss. Similarly, the management can focus on the determinants that increase profitability to accelerate profitability (Alharthi, 2016).

Many renowned researchers emphasized the importance of profitability as the primary contributing variable in measuring the performance of banks.

2.4.3 The bank's Risk Management Capability (Internal Factor)

A bank's risk management capability (RMC) can also be termed as a bank's stability to withstand bankruptcy risks and heavy losses, ultimately affecting the sustainable performance of banks. This subject remained under the focus of researchers and policymakers after the global financial crisis in 2008, as most banks became bankrupt and bore huge losses (Alharthi, 2016). The past researchers adopted different approaches to measure risk management capabilities, such as Z-Score (Ghosh, 2014) developed by Boyd,

Graham and Hewitt (1993), and Capital ratio, i.e., equity to total asset ratio (Horváth et al., 2014). A higher Z- Score indicates that the bank is less prone to bankruptcy; similarly, the higher the capital ratio, the more stable the bank is (Alharthi, 2016). The renowned researchers used some essential internal and external determinants and ignored many essential variables that impact risk management capability (Berger, 2009; Williams, 2014). A bank's Risk management has been considered the internal factor to assess its influence on banking performance (Hang et al., 2021). The ability of the bank or other financial institutions to reduce, adapt, or mitigate the risks and identify the risk assessments to an extent that does not negatively influence the performance of banks in the future. Researchers explain that the more efficiently banks can mitigate risks, the better their performance will be. Risk management is thus utilized as an internal factor of the bank, as also supported by the study (Bessis, 2011; Ishtiaq, 2015).

The internal and external factors can positively or negatively affect efficiency, financial performance, and risk management capability (Alharthi, 2016). These determinants can assist the analysts in identifying the determinants to safeguard against insolvency risks and enhance the banking sector's financial stability.

2.5 Relationship between Efficiency and Sustainable Performance

Bank management efficiency has a moderate relationship with the sustainable performance of Irani banks (Sadjadi et al., 2022). According to Pampurini and Quaranta (2018), the efficiency level, characterized by a financial intermediary and bank production process, is strongly interrelated with sustainable performance. The sustainable performance concept is interlinked with efficiency because both depend on the managers' strategic choices. Profit and cost efficiency are considered the most vital components of the

sustainable performance of banks (Pampurini & Quaranta, 2018). The sustainable performance of social practices in society, such as labor and financial contribution to the projects of the local community and partnership development, will reduce firms' risk (Ciliberti et al., 2011).

The organization's efficiency contributes to efficient employees, good customer service, cost reduction, and improved performance, resulting in sustainable performance (Marie et al., 2014). The sustainable performance concept is strongly associated with efficiency, and both can influence each other because both depend on strategic choice (Pampurini & Quaranta, 2018). Sustainable performance depends on an economic system's efficiency and organization (Scholtens & Van't Klooster, 2019). Corporations with steady and sustainable performance through social, environmental, and financial performance achieve reduced litigation, reduction in cost, and better operational efficiency (KPPHGN et al., 2020).

The efficiency of firms increases by implementing sustainable performance practices in decision-making and business strategy, resulting in overall corporate value and shareholder assets (Portillo-Tarragona et al., 2018). The efficiency of banks can contribute to improving their sustainable performance because the efficient bank can attain a maximum value against an inefficient bank. Efficiency in banking can improve its performance by analyzing how managers can control their overhead or back-office expenses (Bukhtiarova et al., 2020). Similar to other sectors, efficiency in the banking sector is important as it leads to productivity by lessening maintenance costs and increasing the production yields per unit of input (Isnurhadi et al., 2023). Therefore, the difference in the observed input and output variables follows the optimal quantity of input and output variables. It has been observed

that if a bank emphasizes environmental investments, it may lose efficiency, affecting its sustainable performance. The bank's efficiency is a measure utilized for the organization of the sector, which is established to attain the sustainable performance of banks (San-Jose et al., 2018). The efficiency for sustainable performance comprises two inputs, deposits and equity, which assist in controlling funds associated with corporate performance (McGuire et al., 1988).

According to Alharthi (2016), technical efficiency (TE) achieves efficiency by comparing potential and current production. TE illustrates how the management of an organization makes appropriate decisions to get maximum output from input. El Moussawi and Obeid (2011) define technical efficiency as comparing banks' performance with their counterpart confronting the same technology, regulations, and environment based on the production function. Sufian (2007) conducted a study on commercial banks of Singapore and suggested that technical efficiency is the firm's ability to give maximum input from a set input pattern.

Ait Sidhoum et al. (2022) analyzed trade-offs among economic, social, and environmentally sustainable performance. This study used technical efficiency as a proxy for economically sustainable performance, which determined a relationship between technical efficiency and sustainable performance. Alem (2021) used a stochastic approach and evaluated the role of technical efficiency as the environmental variable in achieving sustainable performance. There is a significant relationship between technical efficiency and sustainable performance. Higher technical efficiency enhances sustainable performance, and there is a need to increase technical efficiency to improve sustainable performance (Hepelwa, 2013).

According to Alharthi (2016), pure technical efficiency (PTE) represents the performance of management efficiency measurement that transforms an input into output. If a bank functions more efficiently, its pure technical efficiency is maximum. The PTE is measured by dividing technical efficiency by scale efficiency (Alharthi, 2016). Pure technical efficiency is a technical efficiency measurement devoid of the effects of scale efficiency (Rosman et al., 2014). Technical efficiency ignores the cost of output and input, whereas pure technical efficiency incorporates the cost of output and input.

Sustainable banks are more efficient than non-sustainable banks (Shah et al., 2019). Dia et al. (2020) analyzed the efficiencies relationship with the sustainable performance of the six largest banks in Canada for the period from 2000 to 2007. The study suggested best practices for pure technical efficiency to improve the Canadian banking sector.

Alharthi (2016) states that scale efficiency (SE) is the ability of an organization to produce a big output from a small input. The banks achieve economies of scale through high-sized banking operations, i.e., comparing pure technical efficiency and technical efficiency (Alharthi, 2016). Garza-García (2012) analyzed the industry of banking in Mexico and the following formula for the calculation of scale efficiency:

Scale efficiency (SE) = constant returns on the scale (CRS) / variable returns on the scale (VRS)

Pereira and Marques (2021) studied Brazil's sustainable performance, sustainable management, and sustainable development goals. The authors used a two-stage data envelopment analysis approach to measure the scale efficiency of municipalities of Brazil to measure sustainable performance. A strong relationship exists between scale efficiency and sustainable performance (Pereira & Marques, 2021). Xue et al. (2021) used panel data from

2011 to 2018 to evaluate the sustainable performance and green innovation efficiency of eight Chinese economic areas by categorizing these economic areas into scale efficiency and pure technical efficiency. There is a relationship between green innovation efficiency (sustainable performance), technical efficiency, and scale efficiency (Xu & Zhou, 2021). An organization enhances sustainable development by improving scale efficiency, resulting in sustainable performance (Ma et al., 2021). Based on the above literature review of prior studies, the following hypothesis has been derived by the researcher;

H1: Efficiency has a significant impact on sustainable performance.

2.6 Relationship between Profitability and Sustainable Performance

Sadjadi et al. (2022) researched 23 banks in Iran from 2011 to 2018, and the research results suggest that profitability contributes to the sustainable performance of banks. Another study on "Factors Affecting the Sustainability Performance of Financial Institutions in Bangladesh: The Role of Green Finance" recommends measuring the relationship between profitability and sustainable performance as a future research project (Zheng et al., 2021). Phan et al. (2020) identify a positive and significant relationship between profitability (financial performance) and sustainable development practices, are illustrated in Figure 2.4.

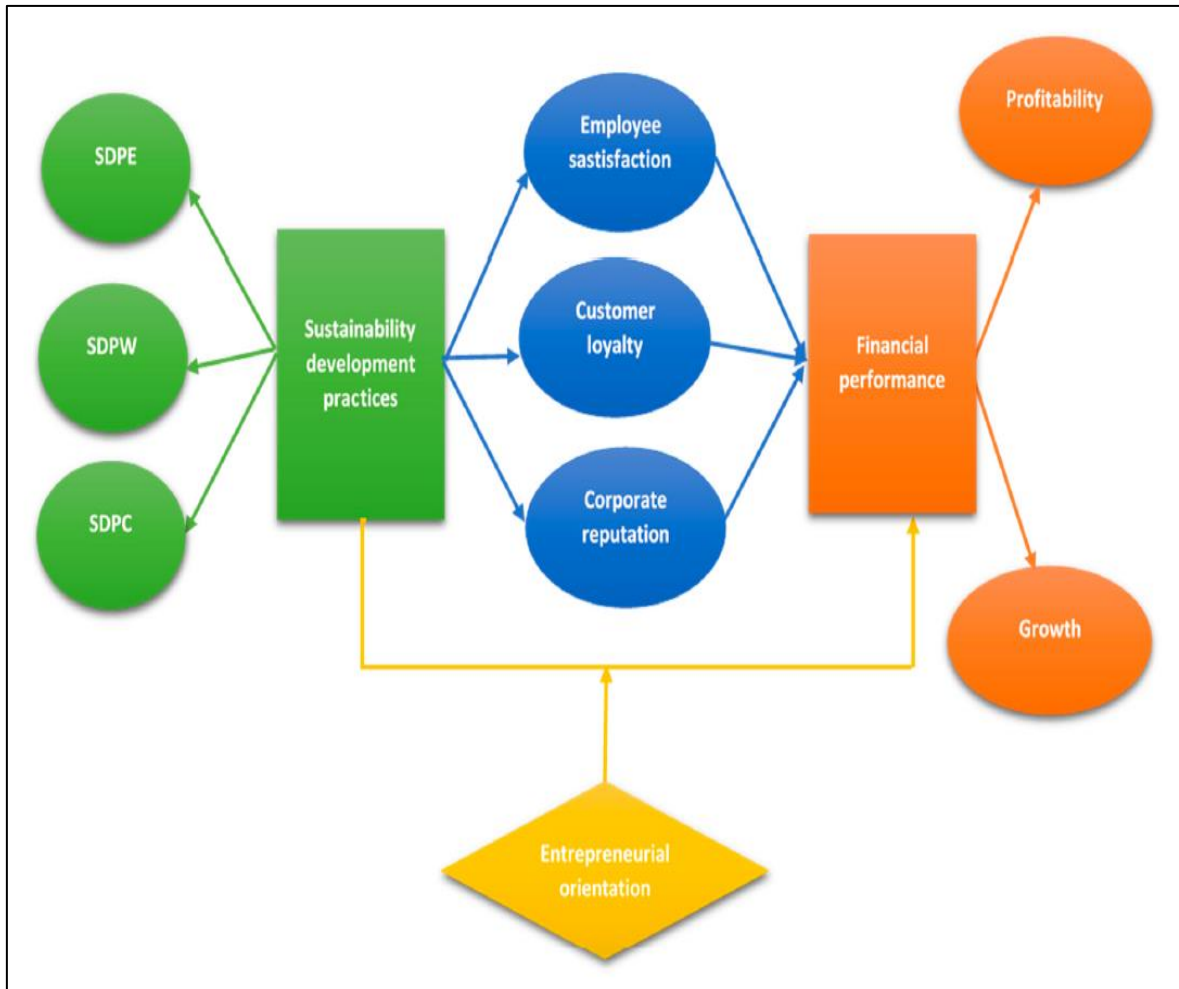


Figure 2.2: Relationship between Sustainability and Financial Performance

Source: Phan et al., 2020

Alshehhi et al. (2018) shortlisted 132 high-rated and peer-reviewed research papers and analyzed the relationship between sustainable performance and financial performance. 78% of shortlisted research publications suggest a positive relationship between corporate sustainable performance and financial performance. The research study findings are illustrated in Figure 2.5 (Alshehhi et al., 2018).

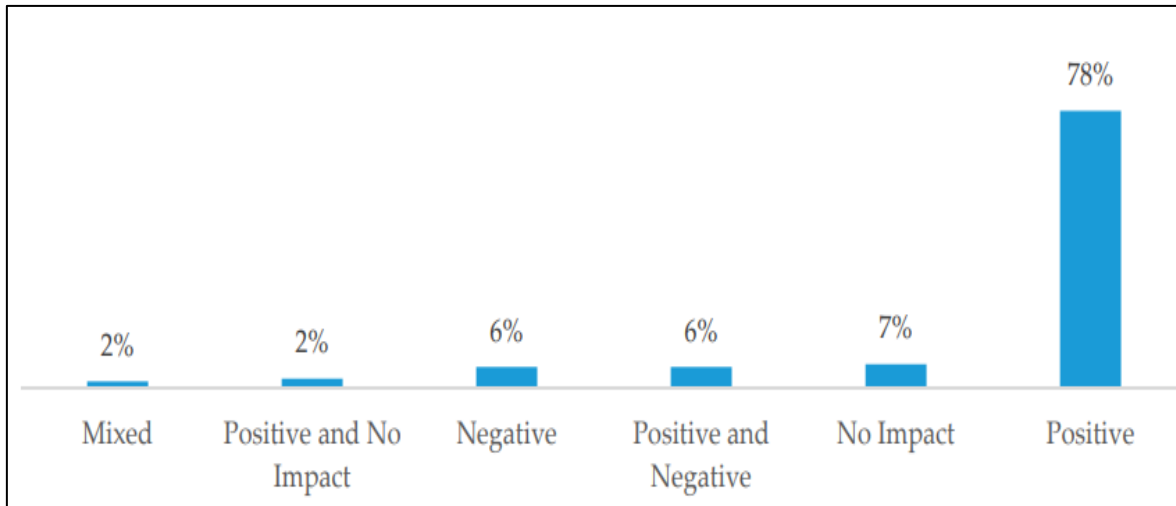


Figure 2.3: The Relationship between Sustainable Performance and Profitability

Source: Alshehhi et al., 2018

A negative relationship exists between corporate social performance and financial performance, and sustainable performance and financial performance are negatively related (Nollet et al., 2016). There are mixed results in the literature about the relationship between sustainable performance and financial performance, and some researchers state that a unidirectional and generalizable relation applicable to different organizations does not exist (Grewatsch & Kleindienst, 2017). Most previous studies indicate a positive relationship between sustainable performance and financial performance (Beurden & Gössling, 2008).

The sustainable performance practices reduced firms' costs through energy-saving and other resources, cost of product return, and liabilities fees, resulting in improved financial performance (Torugsa et al., 2013). Sustainable performance social practices contribute to cost reduction linked with employee training and recruitment, resulting in better financial performance (Davies & Crane, 2010).

Return on equity is achieved by dividing net income by shareholders' equity (Guillén et al., 2014). ROE reveals the ability of management to utilize shareholders' funds efficiently, meaning that in the case of maximum ROE, the management is using the shareholders' funds more efficiently. Alharthi (2016) used ROE as explained variable in his study and used the following formula:

$$\text{ROE} = \text{Net Income} / \text{Total Equity}$$

Nizam et al. (2019) studied 713 banks in 75 countries from 2013 to 2015. The study finds a positive relationship between financial performance and sustainable performance. Banks with assets less than USD two billion positively impact ROE. Jyoti and Khanna (2021) conducted a study to measure the relationship between sustainable performance and the financial performance of companies. The study results indicate a negative relationship between the social score of sustainable performance with return on asset (ROA) and return on equity (ROE). Schabek (2020) measured companies' sustainable and financial performance using ROE using panel regression. The profitability of public companies measured by ROE experiences low financial sustainable performance. The ROA and ROE decrease by increasing the sustainable share in the market.

NIM is the net interest margin to total assets earned. Higher NIM results in valuable investments and better interest revenue. Negative NIM indicates that interest revenue is lower than interest expense, resulting in the risk of loss. Alharthi (2016) used NIM as an explained variable in $\text{ROE} = \text{Net Income} / \text{Total Equity}$.

Angori et al. (2019b) analyzed the determinants of NIM in the Euro area for a period from 2008 to 2014 to measure the sustainable performance of the financial institutions and suggest it was difficult for these institutions to maintain sustainable performance in profits,

especially during the financial crisis due to vulnerability of margin in the European banking system. The capitalization, market power, efficiency level, interest risk, and institution and regulatory setting affected the NIM. The banks are persistently vulnerable to declining sustainable performance in profitability (Angori et al., 2019a). Puspitasari et al. (2021) conducted a study on the banking sector of Indonesia and suggested that the clients, management, and regulators are concerned about the stability and sustainable performance of banks in Indonesia. ROA is a critical measure of sustainable financial performance, and NIM has been used as a moderating variable. To assess sustainable, efficiency, and stability, the NIM has been used as a moderating variable to examine its impact on NIM. The results suggest that NIM must be used to indicate profitability for sustainable banks' performance (Puspitasari et al., 2021).

Dinçer and Altınay (2022) studied seven banks in Turkey from 2010 to 2020 and compared financial performance with sustainable performance. The study used human resources, community involvement, product liability, and environment as criteria for sustainable performance and ROA, NIM, and ROE for financial performance. The results suggest a significant relationship between ROA and sustainable performance, whereas no significant impact was found between sustainable performance and NIM (Dinçer & Altınay, 2022).

The researcher has derived the following hypothesis based on prior literature;

H2: Profitability has a significant impact on sustainable performance.

2.7 Relationship between RMC and Sustainable Performance

The main six research gaps in sustainable performance are risk management capability (RMC), sustainable competitive advantage, innovation in corporate finance

sustainability, corporate finance in sustainability, supply chain ethics in sustainability, and circular economy (Bui et al., 2020). Risk management is vital for achieving sustainable performance within financial intermediaries because the typical procedural requirement of risk management and assessment is quantifying and identifying social and environmental risks (Pampurini & Quaranta, 2018). The report of Serafimova and Vellacott (2015) recommends integrating the sustainable performance criteria in investing and lending activities of banks in managing risk by protecting their asset value in the long and short term. The operating model that includes operational and governance structure and control of the organization to the environment and social risk is an essential link between bank sustainable performance and organizational design. According to the societal and academic viewpoint, examining the association between banks' risk and sustainable performance is vital because the global effect of environmental risk is increasing design.

The analysis of global financial crises suggests that banks' risk management capability can either decrease or increase the impact on the economy or harm the sustainable performance of banks (Disyatat, 2011). (Zheng et al., 2019) conducted a study to investigate the association of banks' risk management with banks' internal and external determinants of sustainable performance using data from 22 commercial banks in Pakistan. The credit risk as loan loss provision reinforces sustainable performance by producing long-term value for bank stakeholders (Zheng et al., 2019). Therefore, a balance is needed between profit and risk to safeguard against excessive risk-taking to achieve sustainable performance because of banks' strategy of non-alignment.

The banks dealing in lending and borrowing businesses remain vulnerable to risk, and to achieve sustainable performance, the banks create credit risk (Akhtar et al., 2011).

According to Zheng et al. (2021), environmental risk management policies were established in Bangladeshi Banks to limit sectors under pollution and enhance environmentally friendly projects. Environmental risk management encourages financial institutions and banks to include environmental and social principles in risk management to achieve overall sustainable performance (Weber & Chowdury, 2020).

To achieve sustainable performance and improve risk management capability, the banks must invest in environment-friendly projects, increasing sustainable performance and reducing overall risk (Zheng et al., 2021). The literature on risk management capability, industry affiliation, and book-to-book market value has yet to be found in the research because this literature contributes to sustainable performance. Based on the above literature review of prior studies, the following hypothesis has been derived by the researcher;

In the backdrop of the global financial crisis of 2008, the banks suffered huge losses, including bankruptcy, and the research related to insolvency risk analysis gained the focus of many authors (Alharthi, 2016). The Z-score is an essential indicator of the risk management capability of banks (Ghosh, 2014). Boyd et al. (1993) developed the Z-score and measured the bankruptcy probability of banks and other organizations. The banks with better risk management capability have high Z-scores and are less prone to bankruptcy.

Fang (2021) analyzed 5221 listed companies in the USA in the sustainable performance information network from 2015 to 2019 and used a fixed effect panel model. The author used a z-score as a proxy to determine the relationship between distress (risk management capability) and sustainable performance and found a positive relationship. The companies following sustainable performance practices have better risk management capability. Orazalin et al. (2019) analyzed 45 companies in Russia to discover the correlation

between risk management capability and sustainable performance. The study suggests that firms enhance their sustainable performance indicator to mitigate risk and ensure financial stability. Hakenes et al. (2015) used z-scores as a proxy for bank efficiency. Banks with low Z-scores are less efficient in capital allocation and project financing, and studies have used the Z-score to measure bank stability. It measures banks' buffers (capital and profits) and risks (measured by the standard deviation of returns). The Z-score can measure the standard deviations required for a return realization to deplete equity.

A higher Z-score means a lower chance of insolvency, which provides a better measure of stability than leverage analysis (Schaeck & Cihák, 2014). Accordingly, a low-risk bank will demonstrate a high z-score, which indicates that many standard deviations in the bank's asset return will have to drop to become insolvent. In the opposite scenario, a lower z-score would indicate a higher risk for the bank. Even though z-scores are widely used for banking risk management, no conclusions have been reached regarding a standard way to calculate a time-varying z-score. While Lepetit and Strobel (2013) addressed some issues, many questions remain to explore, including how to measure elements in the z-score, how window size is selected, and how to measure systemic risk by extending the z-score. The researcher derived the following hypothesis based on the literature review of prior studies.

The capital ratio is a vital component of the risk management capability of banks. A good capital ratio indicates a company's capitalization and risk management capability is improving. The capital ratio is an important indicator of a banks' risk management capability. On the contrary, (Srairi, 2013) found no relationship between capital ratio and banks' risk management capability. In the banking sector, a higher capital ratio might increase the

sustainable performance, profitability, and efficiency of banks' risk management capability (Mamatzakis et al., 2016; Pasiouras, 2008; Rosman et al., 2014). At the same time, some researchers advocate that low capital ratios result in better sustainable performance of banks (Ariff & Luc, 2008; Casu & Molyneux, 2003). Numerous studies have measured the relationship between capital ratios, banks' profitability, and sustainable performance. (Haris et al., 2020) measured the impact of capitalization on profitability for 29 banks in Pakistan by using "the Capital Ratio (CR), Capital Adequacy Ratio (CAR), and Minimum Capital Requirement (MCR)" and the profitability ratios, i.e., "Return on Avg. Assets (ROAA), Return on Avg. Equity (ROAE), Net Interest Margin (NIMAR), and Profit Margin (NMAR)". The results indicate that profitability only increases to a particular level on the increase in capitalization and after that increase in capitalization results in a decrease in profitability.

The profitability ratios (return on equity and return on assets) are correlated with the capital ratios, hence a positive and significant relationship between capital ratios and sustainable financial performance (Chitan, 2012; Sufian & Habibullah, 2009a). Contrarily, (Chronopoulos et al., 2015) studied US banks and found a negative and significant relationship between capital ratios and banks' sustainable financial performance. Few researchers suggest that low capital ratios contribute more toward banks' profitability than higher ones (Curak et al., 2012). Capital ratios are vital for sustainable performance and impact banks' risk management capability (Brandao-Marques et al., 2020; Ding & Sickles, 2019). There is a positive relationship between large commercial banks' risk-taking, sustainability, and capital ratios in the United States (Abbas, Masood, et al., 2021). Based on the above literature review of prior studies, the following hypothesis has been derived by the researcher;

H3: Risk Management capability has a significant impact on sustainable performance.

2.8 External Factors and Sustainable Performance

The external factors explored for the present study are gross domestic product (GDP), inflation, exchange rates, and Interest rates. Based on the literature review of GDP, inflation, interest rate, and the exchange rate, which is discussed in the following section, the literature has been reviewed against each external factor, as explained below.

2.8.1 Relationship between GDP and Sustainable Performance

Majorities of studies considered GDP as the main determining factor of sustainable performance. Hermes and Nhung (2010) investigated the variables of DEA in Asia and Latin America from 1991 to 2000. The countries with GDP growth contributed efficiently, resulting in sustainable performance. The finding of this study is similar to many studies (Garza-Garcia, 2012; Hermes & Nhung, 2010; Zhang et al., 2012; Vu & Nahm, 2013; Tan & Floros, 2013; Hou et al., 2014; Johnes et al., 2014). The GDP growth is the leading indicator of the economic condition; the economy and sustainable performance of banks improve with GDP growth. Therefore, banks focus on the countries with better GDP for investment purposes. These investment decisions include increasing the operation of more branches, capitalization, or mergers and acquisitions. In contrast, Sufian and Habibullah (2009c) argued that GDP impacted sustainable performance and efficiency significantly and negatively in Korean Banks. Some other studies drew similar conclusions (Semih Yildirim & Philippatos, 2007; Moussawi & Obeid, 2011; and Zhang et al., 2012). However, some studies find no significant impact of GDP on sustainable performance (Abu-Alkheil et al., 2012a).

According to Tampakoudis (2013), the sustainable performance indicators are eleven; only seven, including GDP, are statistically significant. However, these are unfavorably related to the growth of GDP. The GDP does not significantly impact sustainable performance (Fioramonti et al., 2019). The use of GDP to measure sustainable economic growth gives the wrong signal to policymakers, especially in countries where positive effects are surpassed by negative ones (Coscieme et al., 2020). Based on the literature on GDP, the following hypothesis has been derived by the researcher;

H4: GDP has a significant impact on sustainable performance.

2.8.2 Relationship between Inflation and Sustainable Performance

Inflation was examined as an independent variable of sustainable performance by El Moussawi and Obeid (2011), and a significant and positive relationship has been noted between inflation and the efficiency of bank performance in Islamic banks. In contrast, most researchers observed a negative relationship between inflation and banks' sustainable performance (Sufian & Habibullah, 2009b; Vu & Nahm, 2013). Whereas some studies have not observed any impact of inflation on the performance of banks (Grigorian & Manole, 2002).

Alimi (2014) examined the relationship between inflation and financial sector performance in Nigeria from 1970 to 2012 and suggested that inflation badly impacted the financial sector's sustainable performance. The inflation due to poor economic performance impacted negatively, resulting in poor economic growth and inequality in income. Therefore, stable prices are mandatory for achieving financial sector development, sustainable financial performance, and economic growth (Alimi, 2014).

Ioan et al. (2020) used panel data analysis to study the relationship between inflation and sustainable performance and GDP in Brazil, Romania, and India from 2005 to 2017.

Sustainable performance decreased due to inflation during the financial crisis 2008 and continued even after the financial crisis (Ioan et al., 2020). Based on the literature on inflation, the researcher derived the following hypothesis;

H5: Inflation has a significant impact on sustainable performance.

2.8.3 Relationship between Interest Rate and Sustainable Performance

Chupina et al. (2022) assessed the relationship between interest rates and the sustainable performance of banks in Russia. The study analyzed the credit market in Russia in the COVID-19 pandemic scenario to assess the sustainable performance of banks. The interest rates were high at the initial stage of the pandemic due to heterogeneity in banks and borrowers. The study results suggest that management tightened interest rates to achieve sustainable performance goals (Chupina et al., 2022). The interest rate reflects the lending interest rate that a bank gains. Interest rates are considered an essential indicator of sustainable performance for financial stability and monetary conditions (Adrian et al., 2019).

According to Al-slehat and Al-tameemi (2021), banks are witnessing a decline in the interest rate due to globalization and liberalization. The banks are resorting to non-interest income-related activities to achieve sustainable financial performance. Sustainable economic growth and performance are negatively related to interest rates (Hatmanu et al., 2020).

Prior studies reported mixed evidence of the effect of interest rates on banks' sustainable performance. Rashid and Jabeen (2016) reported a negative effect of interest rates on banks' sustainable performance, While Yahya et al. (2014) found a positive effect. The interest rate is the amount paid on the principal by the borrower to the bank or the lender. The general market situation and the bank's performance increases rapidly with an increase in banks' interest rate (Shiller & McCulloch, 1987). Samuelson (1945) states, "The banking

system is immensely assisted rather than hindered by an increase in the interest rate, and commercial banks would profit more than savings banks.” Hancock (1985) also devised relevant evidence for the study that the rise in the interest rate reduced employment and output. Based on the literature on interest rates, the researcher derived the following hypothesis;

***H6:** Interest rate has a significant impact on sustainable performance.*

2.8.4 Relationship between Exchange Rate and Sustainable Performance

Keshtgar et al. (2020) analyzed the sustainable performance of 14 Iranian banks from 2007 to 2017 and examined the impact of exchange rates on the financial performance of banks. Banks' financial performance was adversely affected due to the volatile exchange rates. The econometric model used by the researcher reveals that the volatility of exchange rates has a negative and significant impact on the capital return ratios of banks (Keshtgar et al., 2020).

According to Hatmanu et al. (2020), renowned researchers are researching the impact of the exchange rates on sustainable performance. These authors analyzed the impact of exchange rates on sustainable economic growth performance in Romania. Exchange rates positively influence sustainable performance. The exchange rate is highly significant for Romania's economic growth sustainable performance.

An exchange rate is an important feature of the international trade of a nation, economic performance, and balance of payments. A foreign exchange rate is the price at which one currency may be converted into another. During a fiscal year, the average exchange rate is used to measure the exchange rate. Chowdhury and Rasid (2016) suggested that foreign exchange rates should be essential for banks' profitability and sustainable

performance. Thaddeus and Nnneka (2014) examined the factors that influence exchange rates and found that interest rates, inflation, and exchange rates are all highly correlated. According to Ebiringa and Anyaogu (2014), central banks can influence inflation and exchange rates by manipulating interest rates, and changing interest rates impacts inflation and currency values. Higher interest rates offer lenders a higher return than other countries in an economy. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise.

Using Australian exchange rate data, Karfakis and Kim (1995) have found that unexpected current account deficit is associated with exchange rate depreciation and a rise in interest rates. Research suggests that current account deficits diminish domestic wealth and may lead to overshooting exchange rates. Obstfeld and Rogoff (1995) reported that a fall in the currency's real value impacted banks' performance. Two proxies of bank performance (capital deposit ratio and loan loss to total advances ratio) have been examined in a study in Nigeria to find the impact of unstable exchange rates on the performance of banks (Taiwo & Adesola, 2013). This study suggests that the exchange rate impact on the bank's performance is sensitive to the proxy used to capture bank performance. Based on the literature on the exchange rate, the researcher derived the following hypothesis;

***H7:** The exchange rate has a significant impact on sustainable performance.*

2.9 Control Variables

Orazalin et al. (2019) included size, age, leverage, and financial capacity as control variables in their study affecting sustainable and financial performance. The control variables are discussed in the following sections.

2.9.1 Bank Size (Control Variable)

Bank size has been taken as the primary variable in many studies on profitability, efficiency, risk management, and sustainable performance and found a positive, negative, or no impact on these variables. Some researchers suggest that large-size banks are profitable, efficient, less averse to risk, and sustainable. Few studies suggest that smaller banks achieve better efficiency (Ariff & Luc, 2008; El Moussawi & Obeid, 2011; Hasan & Marton, 2003). Many studies observed that the size of banks influenced their efficiency either positively or negatively (Sufian, 2009; Tan & Floros, 2013). In contrast, certain studies conclude that bank size has an insignificant relationship with efficiency (Garza-García, 2012; Wanke & Barros, 2014).

According to Krishna et al. (2021), bank size positively and significantly impacts banks' financial sustainable performance. The results and findings of Houston et al. (2010), Bertay et al. (2013), and Chronopoulos et al. (2015) are also in line with Krishna et al. (2021). In contrast, David and Alhadeff (1964) found that bank size hurts the financial sustainable performance of banks. Few other researchers also support the findings of David and Alhadeff (1964), such as De Haan and Poghosyan (2012) and Petria et al. (2015). In contrast, Quan et al. (2019) suggest that the banks' size has no significant impact on banks' profitability. After achieving some level of profitability, the banks' size experiences a reduction in profitability, whereas the smaller banks start gaining more profitability compared to larger banks (Berger, 1995). Similarly, Curak et al. (2012) and Tan and Floros (2013) reveal that banks' size is irrelevant to profitability.

According to Tabak et al. (2015), a positive and significant relationship exists between banks' size and risk management capability. Banks with large sizes are more stable than smaller ones. Whereas Nguyen et al. (2012), Srairi (2013) and Cubillas and González

(2014) also found a positive relationship between bank size and its risk management capability. Alharthi (2016) results suggest a negative and significant relationship between bank size and Z-score, and the bank size decreased capital ratios for Islamic banks (Alharthi, 2016). The researchers also found a negative relationship between bank size and risk management capability (Ghosh, 2014; Köhler, 2015; Williams, 2014). Krishna et al. (2021) conducted a study on "determinants of bank profitability: empirical evidence from a small Pacific Island developing state," the study results show that risk and bank size have a positive relationship with the performance of the performance banks.

2.9.2 Loan Intensity (Control Variable)

One of the main functions and the bank's primary role is to provide loans. Most studies suggest that more loans increase banks' sustainable performance (Pasiouras, 2008; Semih et al., 2007; Sufian, 2009). Some researchers state that more loan makes a bank more prone to risks (Noor & Ahmad, 2011).

The loan intensity significantly and positively impacts banks' profitability. A study on Chinese banks concludes that more loans result in higher profits (Lin & Zhang, 2009). Chronopoulos et al. (2015) state that reduced loans result in more profits. The loans increase risk-taking and decrease the bank's risk management capability (Berger, 2009). In contrast, a study reveals that banks with higher loan intensity have high z-scores (Köhler, 2015).

2.9.3 Financial Leverage (Control Variable)

Financial leverage has been studied as a variable of efficiency (Abu-Alkheil et al., 2012b). In the first step, his study investigated the efficiency of banks in the UK, Malaysia, GCC, and Turkey from 2005 to 2008. At the same time, the second step evaluated the determinants and variables that had an impact on efficiency and sustainable performance.

Abu-Alkheil et al. (2012b) suggested a negative and significant relationship between DEA scores and financial leverage.

Abu-Alkheil et al. (2012b) examined the relationship between financial leverage and the financial sustainable performance of Jordanian banks from 1993 - 2004 and found that financial leverage is an essential determinant of financial sustainable performance. The financial leverage negatively impacted banks' sustainable financial performance (Abu-Alkheil et al., 2012; Sikandar et al., 2021).

2.9.4 Credit Risk (Liquidity) (Control Variable)

Lee and Chih (2013) investigated the efficiency of large and small banks in China from 2004 to 2011. The study suggests that credit risk, the loan-to-deposit ratio, impacts efficiency and sustainable performance negatively and significantly in smaller banks. Therefore, to raise efficiency, the banks must concentrate on increasing loans. Hou et al. (2014) find the exact relationship between efficiency and credit risk. In contrast, Ariff and Luc (2008) conducted a study on Chinese banks from 1995 to 2004 and found opposite results. The study suggests that efficiency is badly affected by more lending. This study is similar to the study conducted on the Chinese banking sector from 1999 to 2008 (Zhang et al., 2012).

Credit risk influences Pakistani banks' profitability and sustainable performance negatively and significantly (Saghir & Ch, 2020). In addition, it was revealed that the fewer the non-performing loans, the lower the risk factor experienced. The financial risk comprising credit and liquidity risk tends to significantly impact the overall enactment of commercial banks in Pakistan (Saghir & Ch, 2020). A significant increase in loans increases return on equity. The loan-to-deposit ratio is negative to return on equity (Chitan, 2012).

The risk-taking behaviour and liquidity are vital to calculating the risk management capability of banks, and the banks with stable liquidity are highly risk-taking banks (Abbas et al., 2021). There is a negative correlation between loan-to-deposit ratios and z-scores; the banks are liable to take less risk with an increase in the loan-to-deposit ratio, resulting in sustainable performance (Lee & Chih, 2013). There is no relationship between the loan-to-deposit ratio and z-score (Dong et al., 2014). There is a positive relationship between credit risk and banks' risk management capability and sustainable performance (Jeon & Lim, 2013). A significant negative relationship has been observed between banks' risk management capability and credit risk (Matey, 2021).

2.10 Underpinning Theories

Contingency theory and theory of banking and ESG (Environmental, Social, and Governance) have been used in this research, which has been discussed in the following sections

2.10.1 Contingency Theory

According to Hongbo and Fangfang (2010), the Contingency Theory, which became famous in the United States during the 1970s, brought new management ideas to the management sector in the United States and Europe. The theory states, “The basic idea is that environmental characteristics determine the design of effective organization and that managers should weigh and consider the internal and external environmental factors of economic organizations in diversified ways of thinking, using open and systematic concepts and applying the management principles, methods, and skills to the management practices with an adaptation to time, person, place, and matter.” The theory of contingency advocates that, in reality, there is no unchanged internal and external enterprise environment, and

therefore, there are no unchanged and universally applicable principles and modes of management; thereby, enterprise management should change following the environmental conditions. As a famous remark goes, "wisdom of management starts when you realize that the optimal management system does not exist."

As a unique industry, banks' operating performance faces the impacts of the internal and external bank environment, such as changes in the element quality, changes in banking customers, and the external competitive environment. Those factors significantly impact performance appraisal, and the two constitute a contingent relationship between each other. Therefore, establishing a set of bank performance appraisal systems to comply with the environmental requirements affects the bank's sustainable development and directly affects employees' vital interests and business practices (Hongbo & Fangfang, 2010).

According to Ferreira and Otley (2010), the contingency theory remained comprehensive to understand the association between sustainable performance and contextual variables. Ong et al. (2019) advocate that according to the contingency theory of performance, specific organizational characteristics and sustainable performance of an organization cannot be measured with one odd measurement process; rather, comprehensive and contextual procedures influence the efficiency and characteristics of an organization. Therefore, variables relating to the external environment, ownership structure, strategy, organizational structure, and size affect organizational performance. Similarly, Saiful (2017) research on contingency theory clarifies that organizations achieve more performance by using a different contingent factor, and the organizational performance is due to external factors that affect performance. The contingency theory is vital in determining the primary variables in organizational performance. As science is either an inquiry process or a body of knowledge similarly, contingency theory is also a science, including both (Betts, 2011). The

contingency theory framework was developed and graphically illustrated in Figure 2.1 (Otley, 1980). Otley (1980) Contingency Theory Framework encompasses contingent variables that has direct impact on organizational effectiveness. The also used organizational control packages, intervening variable, leading to organizational effectiveness. Therefore, renowned scholars has been using contingency theories in their studies since last 4-5 decades.

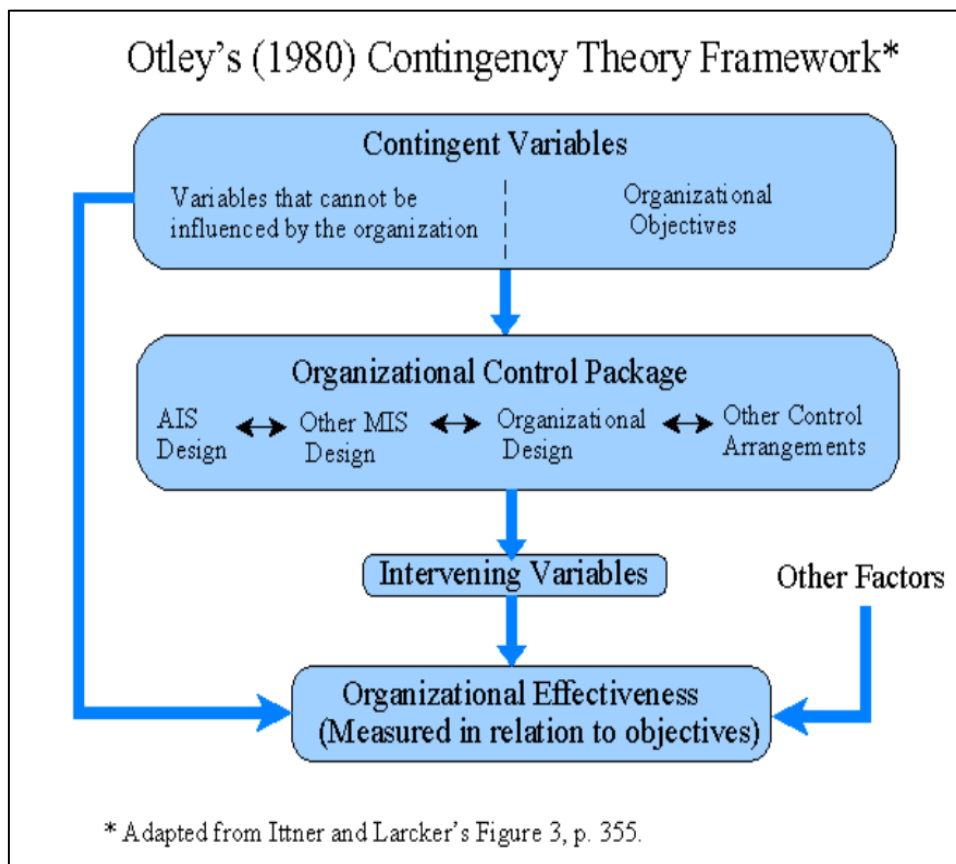


Figure 2.4: Contingency Theory Framework.

Source: Otley, 1980

According to Howard (2014), “contingency theory is a class of behavioral theory that claims there is no best way to organize a corporation, lead a company, or make decisions. Instead, the optimal course of action is contingent (dependent) upon the internal and external

situation. Several contingency approaches were developed concurrently in the late 1960s. They suggested that previous theories, such as Weber's bureaucracy and Taylor's scientific management, had failed because they neglected that management style and organizational structure were influenced by various aspects of the environment: the contingency factors. There could not be "one best way" for leadership or organization. Historically, contingency theory has sought to formulate broad generalizations about the formal structures typically associated with or best fit the use of different technologies. The perspective originated with the work of Woodward (1958), who argued that technologies directly determine differences in such organizational attributes as the span of control, centralization of authority, and the formalization of rules and procedures" (Howard, n.d.).

2.10.2 Banking Theories

The failure of prominent economists to incorporate banking into their economic theories has been identified as a significant and costly weakness (Werner, 2016). Similarly, it has been pointed out that the macroeconomic feedback of banking activity needs to be addressed in finance research (Werner, 2012). According to Werner (2016), there are mainly three theories of banking that have dominated the literature in the past century: "(1) The currently prevalent financial intermediation theory of banking says that banks collect deposits and then lend these out, such as other non-bank financial intermediaries. (2) The older fractional reserve banking theory says that each bank is a financial intermediary without the power to create money, but the banking system collectively can create money through 'multiple deposit expansion' (the 'money multiplier'). (3) The credit creation theory of banking, predominant a century ago, does not consider banks as financial intermediaries that gather deposits to lend out but instead argues that each bank creates credit and money when granting a bank loan".

2.10.3 Environmental Social Governance (ESG) Model

The sustainable performance of banks can be referred to as banks creating value considering environmental, social, and economic perspectives for their customers. The banking sector of any country focused on sustainable performance plays a great part in becoming environmentally responsible. For example, in banks, the usage of paper is undertaken to a great extent, which threatens environmental damage in the long run. So, to nullify the adverse environmental impact, banks must closely observe the operations that contribute to the unsustainable performance of banks and alter their practices by remaining environmentally responsible institutions. The environmental, social, and governance (ESG) model is worth discussing here as it is used to assess the business practices of an organization and its performance regarding different ethical and sustainable performance issues (Galletta & Mazzù, 2023). When ethics, sustainable performance, and corporate governance are usually considered as "non-financial" indicators, the ESG program plays an important role in ensuring the implementation of processes and systems and ensuring accountability to manage the impact of a business as its carbon footprint, the way employees get treated in the company, stakeholders and suppliers. Aldowaish et al. (2022) explain that in sustainable performance, efforts are directed at positioning companies to gain long-term success based on business strategies and responsible corporate management.

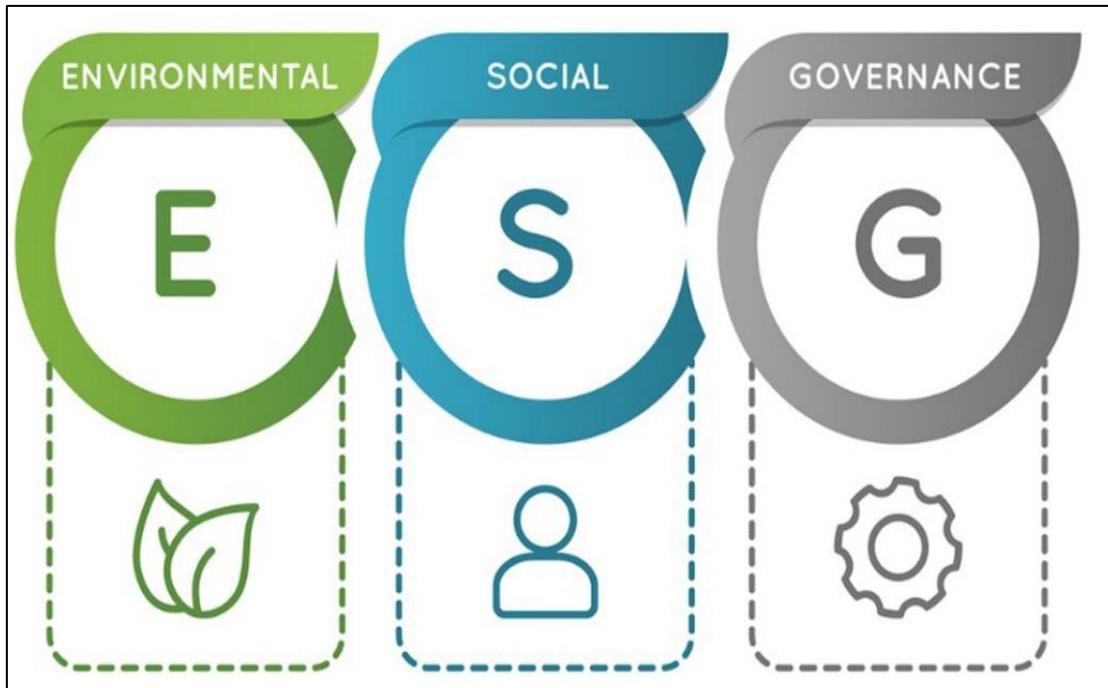


Figure 2.5: ESG Framework.

Source: EcoMatcher, 2022

The environmental, social, and governance-associated risks and opportunities are increasingly becoming relevant for financial institutions. ESG concerns do not only make considerable sense for the environment; the sustainable functions are associated with adequate economic performance (Citterio & King, 2023; Kluza et al., 2021). Therefore, financial institutions such as banks are not only concerned with their "ESG" footprint, but banks also observe the risks and opportunities. The recent research by Galletta et al. (2023) also investigated the relationship between ESG "environmental, social, and governance" combined scores and banks' operational risk. By highlighting the importance of the ESG model, this research assists the supervisory and regulatory bodies regarding the significance and utmost importance of ESG drivers on the market, credit, operational risks, and liquidity in the risk management framework. Therefore, ESG is equally beneficial for organizations

and financial institutions as banks as it emphasizes the productivity of human capital and sustainable employee performance, leading to improved bank performance. Banks that invest in the initiatives of ESG illustrate a higher control over risk management, create adequate and better associations, and strengthen their image, which results in improved performance.

2.11 Hypothesis Development

Based on the review of the literature regarding internal factors (efficiency, profitability and risk management) and external factors (GDP, Inflation, Interest Rate and Exchange rate), the following hypothesis can be formulated:

2.11.1 Internal Factors

H1: The efficiency of banks significantly impacts the sustainable performance of banks.

H2: The profitability of banks significantly impacts the sustainable performance of banks.

H3: The risk management capability of banks significantly impacts the sustainable performance of banks.

2.11.2 External Factors

H4: Gross Domestic Product (GDP) significantly impacts the sustainable performance of banks.

H5: Inflation significantly impacts the sustainable performance of banks.

H6: Interest rate significantly impacts the sustainable performance of banks.

H7: The exchange rate significantly impacts the sustainable performance of banks.

2.12 Framework of Research

The literature establishes a relationship between internal factors, external factors, and sustainable performance. Sustainable performance is the dependent variable. Efficiency, profitability, and risk management capability, are the internal factors and independent variables. The external factors are GDP, inflation, Interest rate and exchange rate are also independent variables. Control variable are Size, Loan intensity, financial leverage and Credit risk. The study framework is illustrated in Figure 2.6.

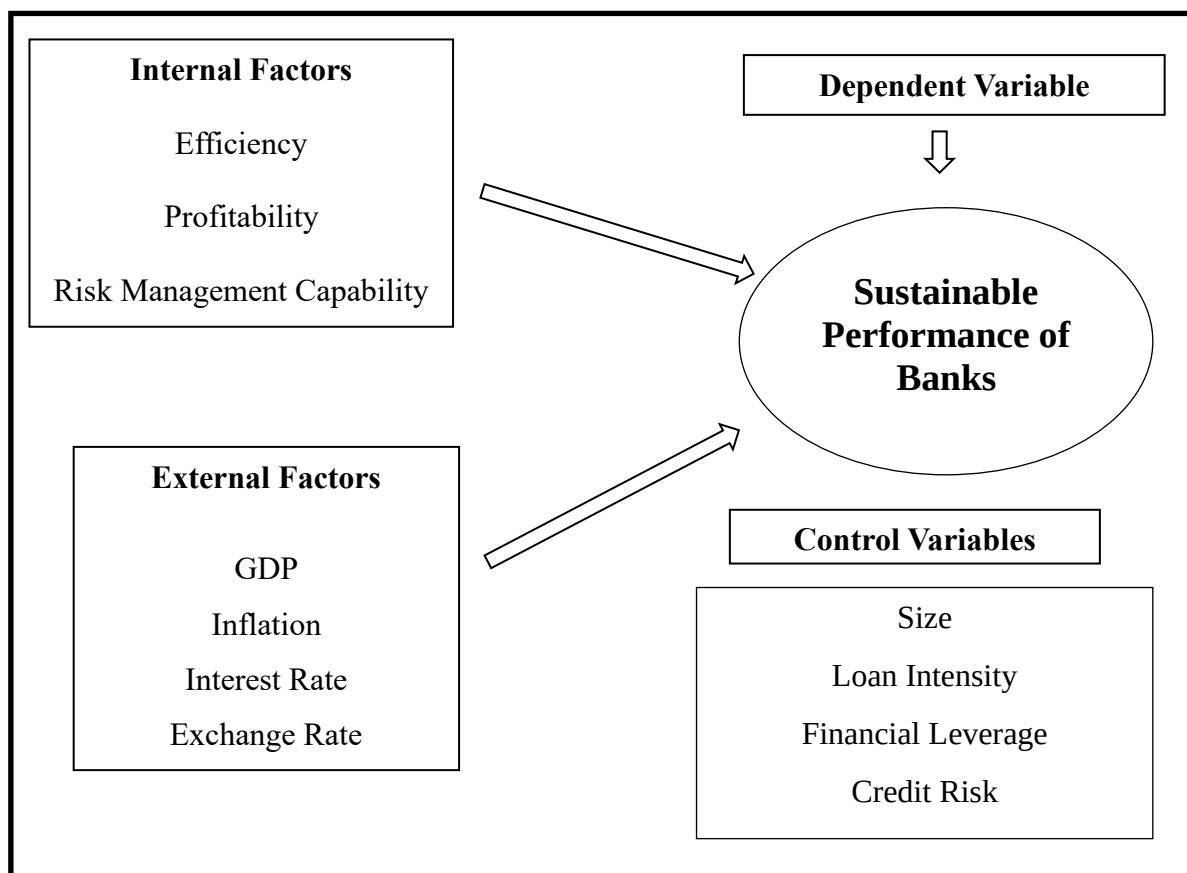


Figure 2.6: Framework for Sustainable Performance of Banks

2.13 Chapter Summary

Literature related to the sustainable performance of banks has been discussed in the chapter literature review. The banks' efficiency and sustainable performance relationship

have been reviewed. The association between banks' profitability and sustainable performance was researched in this chapter. The linkage between risk management capability and sustainable performance has been studied. The impact of external variables on sustainable performance examined by the prior studies has been written. The influence of banks' specific internal factors on sustainable performance was investigated. Based on these relationships, research hypotheses have been derived. Banks' sustainable performance contributes to the banking sector's overall sustainability. The banking sector can enhance efficiency, profitability, and risk management capability to achieve sustainable performance in Pakistani banks.

Major gaps in the existing literature have been identified. The sustainable performance of banks is a neglected area of research, especially in Pakistan. Independent studies on efficiency, profitability, risk management, and the relationships of these variables with sustainable performance have been conducted in the literature. The relationship of these variables with sustainable performance has not been discussed in one study to measure banks' overall sustainable performance. Similarly, the impact of external and internal factors on sustainable performance in one holistic study needs to be researched.

After identifying the research gap by reviewing the literature of prior studies, the research framework has been formulated. Sustainable performance is the dependent variable, whereas efficiency, profitability, risk management capability, and external variables are the independent variables. The internal factors have been taken as control variables. The contingency theory and financial intermediation theory of banking have been used. The contingency theory remained comprehensive in understanding the relationship between sustainable performance and contextual variables (Ferreira & Otley, 2010). The financial intermediation theory of banking measures banks' efficiency, profitability, and risk

management capability. The financial intermediation theory has been reinforced and utilized by high-ranking journals, and well-known economists also utilized it in their studies. The next chapter is the research methodology.

CHAPTER 3

METHODOLOGY

3.1 Overview

This chapter explains the research methodology used for this thesis and elaborates on the research designs used for data collection. The research process outlined by Saunders et al. (2007) is illustrated in Figure 3.1.

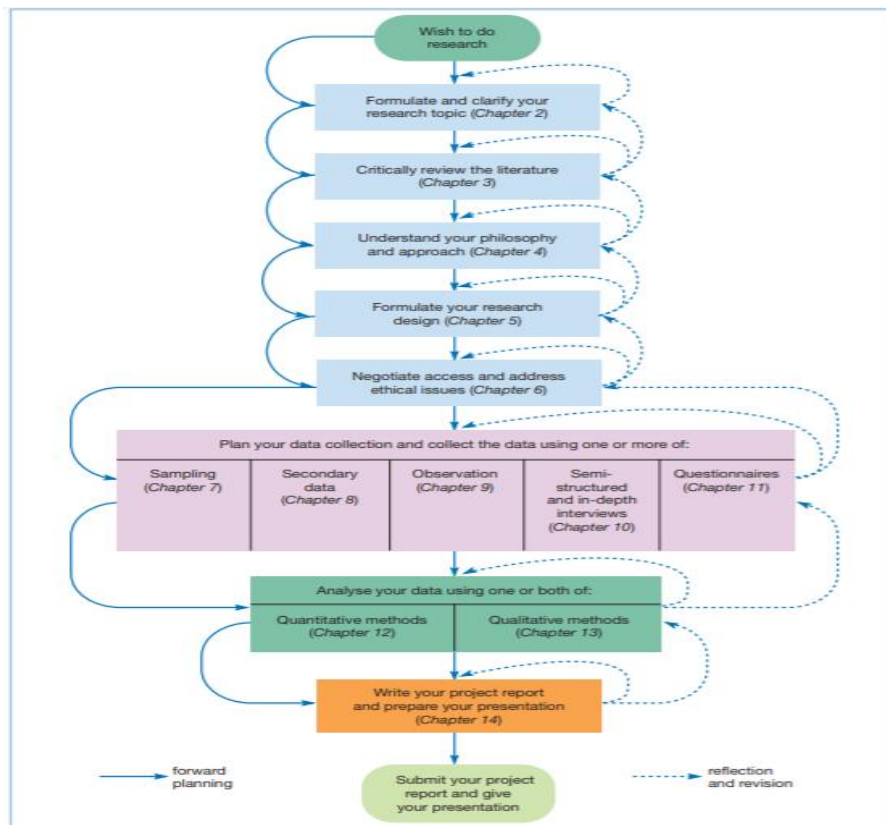


Figure 3.1: The Research Process.

Source: Saunders et al., 2007

Initially, this chapter introduces research philosophy, approach, methodology, i.e., qualitative or quantitative, and research strategy, i.e., theoretical scheme behind data

collection. Then research design, population and sampling, and data collection method are presented. Lastly, data analysis techniques and ethical considerations are described. The research design is developed from the objectives of the thesis and research questions. This chapter systematically presents these research methods and procedures for the empirical study. Figure 3.1 illustrates the research onion with methodology components (Saunders et al., 2019).

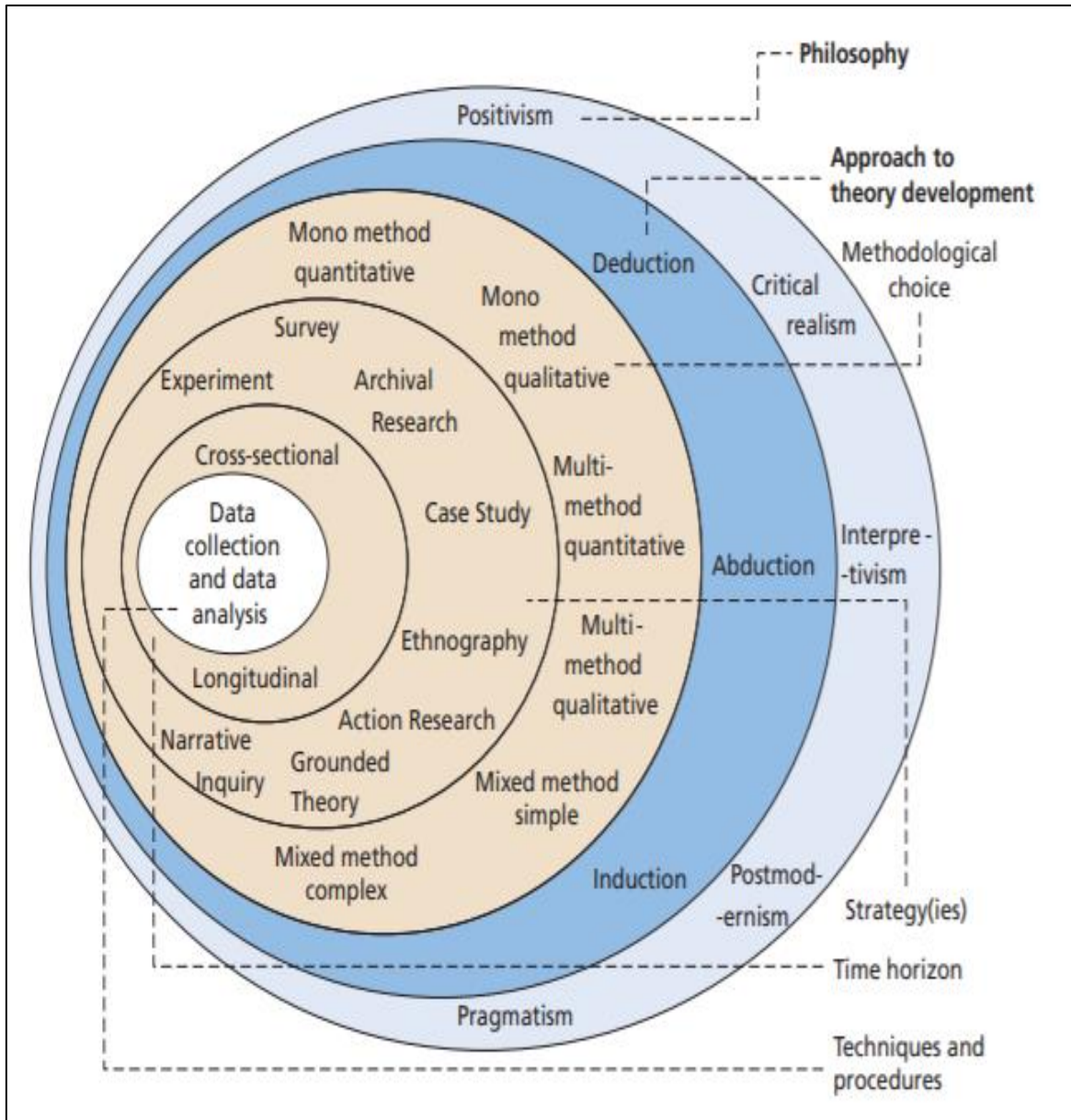


Figure 3.2: The Research Onion.

Source: Saunders et al., 2019

3.2 Research Philosophy

A researcher makes numerous assumptions while conducting a study cautiously or incautiously (Kamal, 2019). According to Saunders et al. (2019), the research philosophy means the system of assumptions and beliefs regarding developing knowledge. This

knowledge development may not only introduce a new theory; the new research may also address a particular problem in an organization (Saunders et al., 2007).

Current research also aims to investigate the issues of sustainable performance problems of Pakistani Banks by studying the impact of internal factors (efficiency, profitability, and risk management capability) and external factors (GDP, inflation, interest rate, and exchange rate) on sustainable performance. A researcher mostly encounters three assumptions in research: ontological assumptions, which refer to the realities encountered in research; epistemological assumptions, which refer to assumptions about human knowledge; and axiological assumptions, which refer to the values and ways of the researcher that influence the research process (Saunders et al., 2019).

The relation between independent and dependent variables has been measured in this research. The quantitative approach has been adopted for data collection and data analysis. Initially, this research measures the relation between variables; the second ontological assumption suggests a realistic position based on social facts. In the third assumption, the epistemological position of the independent facts based on human knowledge is reflected in the banking performance studies. In the fourth assumption, the axiological position suggests that the values and beliefs of researchers are based on ontological and epistemological assumptions. Hence, a functionalist approach has been adopted to achieve the study's objectives. This research primarily uses the contingency theory and the ESG model to develop hypotheses using the deductive approach, focusing on the association between external factors, internal factors, and sustainable performance. For this study, secondary data was collected from the financial statements of the selected banks. The World Bank and OLS panel method was used to test the formulated hypotheses for this study. The researcher has

been guided by these philosophical assumptions, which helped him justify his research approach. The next section explains the research approach.

3.3 Research Approaches

Theory is involved in a research study, which may or may not be made clear in the research design; however, this is generally reflected in the conclusions and findings. The researchers mainly adopt two contrasting approaches: deductive and inductive (Saunders et al., 2019). Deductive perspective results when the conclusions are logically drawn through theory-driven premises, and when premises are true, conclusions are termed valid (Ketokivi & Mantere, 2010; Saunders et al., 2019). The difference between deductive and inductive research is illustrated in Figure 3.3 (Saunders et al., 2007).

<i>Deduction emphasises</i>	<i>Induction emphasises</i>
■ scientific principles ■ moving from theory to data ■ the need to explain causal relationships between variables ■ the collection of quantitative data ■ the application of controls to ensure validity of data ■ the operationalisation of concepts to ensure clarity of definition ■ a highly structured approach ■ researcher independence of what is being researched ■ the necessity to select samples of sufficient size in order to generalise conclusions	■ gaining an understanding of the meanings humans attach to events ■ a close understanding of the research context ■ the collection of qualitative data ■ a more flexible structure to permit changes of research emphasis as the research progresses ■ a realisation that the researcher is part of the research process ■ less concern with the need to generalise

Figure 3.3: Difference between Deductive and Inductive Approaches

Source: Saunders et al., 2007.

In deductive research, empirical observations are used to test a theory, moving from general to particular (Khalid et al., 2012). The inductive approach, in contrast, involves moving from individual observations to the general pattern statement (Collis et al., 2021). These researchers suggest that induction assists in developing a theory, and deduction helps test the theory.

The deduction contributes to positivism, and induction owes to interpretivism (Saunders et al., 2019). According to Bryman (2008), the deductive approach follows positivism and realism and tests a theory through a quantitative approach using epistemological and ontological assumptions.

Current research begins with a comprehensive literature review to comprehend the research domain. After reviewing the literature, the research gap has been identified, and a conceptual model has been developed. This step is followed by hypothesis development and testing. Data is mandatory to test the model and examine hypotheses. The data type has been identified as quantitative by establishing an epistemological stance.

The present research is conducted on principles of positivism and objectivism and is associated with the deductive research approach. Current research aims not to develop a theory; instead, it aims to test an existing theory and hypotheses that have been built on existing literature. The empirical data was collected, and hypotheses were tested by analyzing the data to verify the validity and reliability of the framework. The next section explains the research method.

3.4 Research Methodology

The main research methodologies include quantitative, qualitative, and mixed-method (Saunders et al., 2019). Quantitative research comprises the empirical and systematic

investigation of phenomena through mathematics and statistics processing of numerical data (Saunders et al., 2019).

The statistics utilized in quantitative research are from mathematics and are used when: "(a) there is a need to analyze and process large volumes of quantitative data to verify hypotheses and test a theory, (b) there is uncertainty related to theories under consideration, (c) research might be effectively carried out with questionnaires containing simple questions and short answers and (d) the data obtained can be quantified and compared" (Saunders et al., 2019 .p.2).

According to Van Maanen (1983), the data collection type is the main difference between the two methodologies—the data used in quantitative research in numbers through surveys and experiments. Quantitative research aims to analyze data statistically and accept or reject the already identified hypotheses.

The mind map representing qualitative and quantitative methodologies has been illustrated in Figure 3.3 and Figure 3.4 (Almeida et al., 2017). Mind mapping helps brainstorm, stimulates creative thinking, and is a beneficial instrument in understanding a complex subject (Davies, 2011).

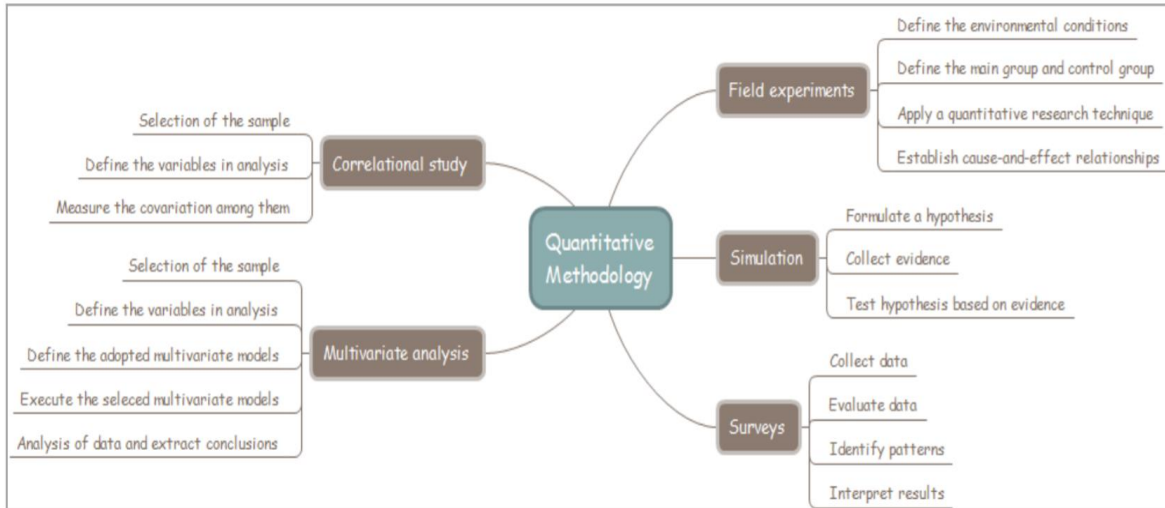


Figure 3.4: Mind Map of Quantitative Research Methodology.

Source: Almeida et al., 2017

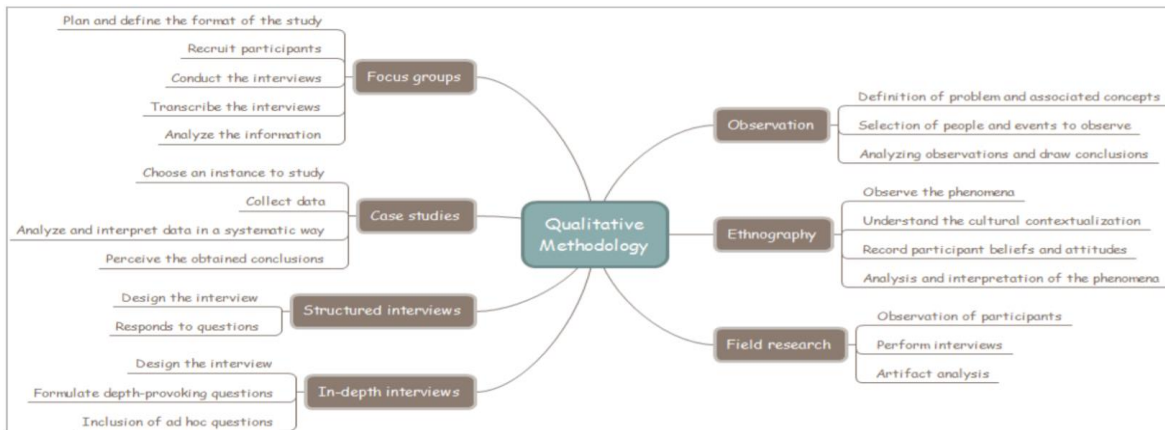


Figure 3.5: Qualitative Research Methodology Mind Map.

Source: Almeida et al., 2017

The present thesis uses a quantitative research approach for the collection of data. The quantitative methodology is based on secondary data collection. All three research objectives of the study have been analyzed in Chapter 4 using secondary data.

3.5 Research Strategy

The research strategy is a "general plan of how the researcher will go about answering the research question(s)" (Saunders et al., 2007, p.10). The selection of a suitable research strategy has to be based on research objectives and questions, the resources and time available, and the extent of existing literature required to be researched (Saunders et al., 2019). The researcher selects the appropriate research strategy, keeping each strategy's circumstances and pros and cons (Yin, 1981).

However, for this study, secondary data was collected from the associated resources to determine the impact of external and internal factors on the sustainable performance of the selected banks. The secondary data for external factors, including GDP, inflation, interest rate, and exchange rate, was collected from the official website of the World Bank. In contrast, the secondary data for internal factors, including efficiency, profitability, risk management capability, and control variables, were collected from the financial statements of the selected banks for this study, which were later self-evaluated.

3.6 Research Design

The research design aims to produce a research project by turning research objectives and questions into a research project considering research choices, strategies, and time horizons (Saunders et al., 2007). The research design is a course of action that guides the researcher in collecting, analyzing, and interpreting observations. The research design can be classified into three types considering the research purpose: exploratory, descriptive, and explanatory (Churchill et al., 1996; Saunders et al., 2007).

The descriptive design is related to an occurrence relationship or an incidence between the variables, and it takes place when researchers desire to describe some of the

characteristics of a phenomenon (Dulock, 1993). Descriptive research reveals an exact situation, event, and personal profile. Descriptive research attempts to answer what, who, when, how, and where (Cooper and Schindler, 2006). The explanatory research design establishes the relation between the variables and emphasizes studying a problem or situation to clarify the relationship between the variables (Saunders et al., 2007). Explanatory research is mainly hypothesis testing when the researchers tend to present relationships. This design is related to studying the effect relationship and cause (Khalid et al., 2012).

The present research is descriptive and explanatory. First, phenomena have been explained, and then the relationship of variables has been described. This research explains the already well-defined relationships with new data. The present research investigates and tries to establish the relationship between the internal factors, external factors, and sustainable performance of Pakistani banks. The explanatory research has been incorporated.

The research's time horizon is described as cross-sectional and longitudinal research. Cross-sectional research studies a particular problem in a specified time (Li et al., 2009). Contrarily, the longitudinal design measures variation in the problem over a while, and data is gathered at different time frames (Saunders et al., 2007; Sekaran & Bougie, 2010). Longitudinal research design demands more effort, time, and cost and necessitates the researcher's participation in the field of research for a prolonged duration besides heavy financial support. The panel data used for this research was gathered for a fixed period extended over five years. Thus, this study is longitudinal.

3.7 Research Population and Sampling

The unit of analysis is the main entity of individuals or groups a researcher analyses in the research study—the present research analyses banks and the banking sector. The unit

of analysis for current research is the banking sector of Pakistan. Secondary data has been collected from the financial statements of the selected banks for this study. However, the management will also benefit at the micro-level, but the research is not purely from the management's point of view.

Sampling has a vital role in quantitative research. An adequate number of units of analysis must be used for statistical analysis (Saunders et al., 2007). The present study's research population comprises all Pakistani banks, including public and private (domestic and foreign) banks. Therefore, instead of sampling entire population of all 32 banks of Pakistan has been analyzed to measure sustainable performance of banks.

32 Banks are listed with the State Bank of Pakistan. These include 29 commercial banks (19 private sectors, five foreign, and five public) and three specialized (SBP, 2021). Every bank has hundreds of branches spread all over the country. The population for the present research study is 32 banks with more than 1000 branches. The period used for this study is 2016 to 2020. State Bank of Pakistan in 2017, through circular number five, emphasized and approved digital strategy for all banks by focusing on digital services and products through end-to-end digitization (SBP, 2017). Pakistan is a developing country, and the availability of data on the entire population is challenging. Due to growing mobile network services and the government's focus on digitization, the researcher collected data from the entire population from 2016 to 2020 because banks are digitized thereafter. Moreover, the researcher collected time series data for the respective banks between 2016 and 2020 because the banking sustainable performance and organizational sustainability directive was introduced in the country in 2016.

The board shall also approve a "Digital Strategy" covering the following objectives:-

a) Development of customer-focused digital products and services. b) End-to-end

digitization of processes for delivery of digital products and services. c) Interoperability of delivery channels.

3.8 Data Collection Methods

The unit of analysis is the main entity of individuals or groups a researcher analyses in the study. According to De Leeuw (2008), in the case of primary data, the researcher generates the data through interviews, experiments, and surveys designed to understand and solve the problem. On the contrary, the researcher uses the data generated by different organizations, healthcare departments, and government institutions to maintain institutional records in the secondary data.

Buteikis (2018) suggests the three most commonly used data types in data analysis: cross-sectional, time series, and panel data. In the cross-sectional data type, the researcher collects data in a single period characterized by counties, companies, units, and people. In the time series, the researcher collects data at specified points, such as interest rates, stock prices, GDP, product prices, and exchange rates, observing data at different frequencies. In panel data, the researcher combines cross-sectional and time series by observing the same cities, firms, or persons at numerous points in a week, month, or year.

This research uses the secondary data from five years of all banks of Pakistan for a period from 2016 to 2020. Panel data encompassing multiple sectors and multiple years have been used. The quantitative methodology has been used to analyze the data.

3.9 Econometric Model

The following equation has been developed to determine the impact of internal and external factors on the sustainable performance of Pakistani Banks. For this purpose, the OLS method, Random, and Fixed Effect Model were used for quantitative analysis.

$$SP_{it} = \alpha + \beta_1 Eff_{it} + \beta_2 Prof_{it} + \beta_3 RMC_{it} + \beta_4 GDP_{it} + \beta_5 IR_{it} + \beta_6 EXR_{it} + \beta_7 INF_{it} + \beta_8 Size_{it} + \beta_9 LoanInt_{it} + \beta_{10} CRisk_{it} + \beta_{11} Lev_{it} + \varepsilon_{it} \quad \text{Equation 3.1}$$

Whereas,

SP is the dependent variable, demonstrating the sustainable performance, while subscripts “i” and “t” refer to ith bank, and year of observation. β_{1-11} refers to the coefficient for the predictor and control variables. β_{1-3} represent the internal factors i.e., efficiency, profitability, and risk management and control abilities of the banks, and β_{4-7} represent the external factors i.e., the GDP, exchange rate, inflation, and interest rate for the country, and β_{8-11} represents the control variables for the study. Lastly, ε is the error term.

3.10 Data Analysis Techniques

To analyze the collected data, the researcher used E-views v14. This software is prominent in today's researcher's world and is mainly used in secondary data analysis. Researchers used different types of tests to complete the study purpose. First, the researcher applied the descriptive test to get the data description, then plotted the QQ plots to test the normality of each variable. Furthermore, a correlation test was applied to assess the association among the variables. Lastly, the OLS panel method was used to test the study hypotheses; in the OLS panel methods, two methods were used, i.e., the fixed-effect model and the random-effect model.

The ordinary least square (OLS) method is often used to analyze the panel data. This "linear regression technique" determines a model's unknown parameters (Anakpo & Oyenubi, 2022). This method depends on reducing the sum of the squared residuals between the predicted and the actual values obtained from the model. OLS is regarded as an efficient estimation technique even when the sample size is small, and it is stated that OLS with panel-

corrected errors is a reliable estimation technique (Baltagi & Baltagi, 2008; William, 2018; Yaffee, 2003). The common effect equation in OLS regression is stated as follows:

$$y_{it} = \alpha + \beta'X_{it} + \varepsilon_{it}$$

N represents the cross-sections such that $i = 1, 2, \dots, N$. Similarly, T shows the number of periods, such as $t = 1, 2, \dots, T$. Therefore, this study also applied the OLS method to determine the impact of external and internal factors on sustainable performance in Pakistani banks. Furthermore, in the fixed effect model, it is assumed that the variation between cross-sections can be accommodated from different intercepts (Hsiao, 2022), and the regression equation is stated as follows:

$$y_{it} = \alpha_i + \beta'X_{it} + \varepsilon_{it}$$

Where $i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$

In the random effect model, there may be interconnections among the residuals across time and cross-sections (Hsiao, 2022). Therefore, the model depends on the assumption that each individual has a different intercept, which is treated as a random variable. Consequently, this model incorporates two types of residuals (Zulfikar & STp, 2018). The first one represents the overall residual, combining cross-sectional and time-series components. The other residual is an individual residual representing a random characteristic unique to each observation of the i -th unit (Zulfikar & STp, 2018). The equation below represents the fixed-model regression:

$$y_{it} = \alpha_i + \beta'X_{it} + u_i + \varepsilon_{it}$$

Where $i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$, ε_{it} represents the overall residual, and u_i represents the unique residual that prevails at all times and represents the random characteristics of i -th observation.

3.10.1 Fixed-Effect (FE) Model

According to this model, various intercepts can accommodate the distinctions between individual factors. As stated earlier, the FE model permits the intercept to vary across cross-sections, and the individual effects of independent variables are treated as "fixed." While the FE model is different from the common effect, the FE model relies on the OLS principle (Zulfikar & STp, 2018). A “dummy variables” technique was used to estimate the FE panel data (Zulfikar & STp, 2018). This helped in determining the differences between the intercept banks. This estimation model is called the “Least Squares Dummy Variable (LSDV).”

3.10.2 Random-Effect (RE) Model

This model estimates panel data focusing on the interconnection between the individuals and the time within the context of interface variables. The Random Effects model is applicable when there is a potential interconnection among the explanatory variables across time and individuals in panel data. This model accommodates intercept differences by incorporating error terms specific to each entity (Vijayamohanan Pillai, 2016). A key advantage of the RE model is its strength in addressing heteroscedasticity, which is also referred to as the Error Component Model (ECM) or Generalized Least Square (GLS) technique (Zulfikar & STp, 2018). In contrast to the Common Effects and FE models, the RE model employs the principle of maximum likelihood or general least squares rather than depending on OLS. This distinction marks the primary differences in estimation approaches among these models. Each bank’s error terms were used in this model to accommodate the distinction between intercepts (Zulfikar & STp, 2018). This model helps eliminate heteroscedasticity. It is also known as the “Generalized Least Square (GLS) technique.”

Moreover, some diagnostic tests were also applied to ensure the data suitability.

3.10.3 Unit Root Test

The unit root test is crucial to determine the stationary characteristics of the variables under study. It helps identify whether there is a linkage between the historical values of the variables or not. This test is also effective for order integration determination depicted by the variables. For this study, the “panel unit root test” was utilized, considered superior to the “time-series unit root test” within the context of finite samples. Different types of unit root tests have been proposed in past studies, including the Fisher-type tests, which incorporate PP and ADF tests (Maddala & Wu, 1999), the IPS test (Im et al., 2003), and the LLC test (Levin et al., 2002).

The present study adopted the LLC test, widely used in research involving panel data (Worthington & Higgs, 2007). The LLC allows for individual and time effects and permits the residual variance, intercept, and higher-order autocorrelation to vary (Bai et al., 2022). Furthermore, it caters to different lag lengths across the cross-sections, and the LLC test is then deemed a pool ADF test when lags are included (Bornhorst & Baum, 2006). The LLC test has been widely used in panel data analysis and allows the examination of the unit root (Bai et al., 2022). In the LLC test, the hypothesis under evaluation is that the time series possesses a unit root, which is tested against the alternate hypothesis, stating that there is an absence of a unit root, which implies stationary. Therefore, the equation is composed as follows:

$$\Delta y_{it} = \delta y_{it} - 1 + \Phi_i' \Delta y_{it} + \alpha_i' d_t + \varepsilon_{it}$$

3.10.4 Cross-Sectional Dependence Test

Cross-sectional dependence is one of the essential diagnostic tests applied before analyzing the panel data. However, panel data can be subjected to “pervasive cross-sectional

dependence” as all units are correlated within the same cross-section (Tugcu, 2018). This usually results in the effects of unobserved factors, which are common in all units, leading to ineffective outcomes. Thus, the present study's cross-sectional dependence test was conducted to prevent bias.

In the present study, two tests were conducted for testing cross-sectional dependence. The Pesaran and Breusch Pagan tests were utilized (Hsiao et al., 2007; Pesaran, 2021). The Breusch Pagan test offers a Lagrange multiplier to evaluate the null hypothesis of cross-sectional independence (Hsiao et al., 2007).

$$LM = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N (Tp_{ij}^2 - 1)$$

The Pesaran test exhibits power and reliability, with a null hypothesis stating that there is weak cross-sectional dependence against the alternate hypothesis indicating the presence of strong cross-sectional dependence (Hsiao et al., 2007). The benefit of using the Pesaran test is that it is based on the assumption that the errors are symmetrically distributed (Hsiao et al., 2007). The CD test is written as follows:

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^N \tilde{p}_{ij} \right)$$

3.10.5 Cointegration Test

The association between the variables of a study is determined with the help of a cointegration test. This study focuses on the impact of external and internal factors on sustainable performance in Pakistani banks; therefore, the Engle-granger cointegration test was utilized for this study to determine the association between external and internal factors and sustainable performance (Camba Jr & Camba, 2021).

If a set of variables is cointegrated, the variables share a common stochastic trend (Chan, 2001). It certifies the presence of stationarity for linear combinations of some components of a multivariate time series (Chan, 2001). The “Engle-Granger” test is considered a robust statistical technique for cointegration. The two-step approach in this test is beneficial because it is relatively straightforward to implement (Sjö, 2008). When there is a single cointegrating vector, this method takes advantage of the consistency property of OLS, which ensures efficiency and obtains reliable estimates of the cointegrating vector. In the two-step approach in the "Engle-Granger" test, the first step involves estimating the cointegration association (Chee-Yin & Hock-Eam, 2014). The second step in the procedure focuses on the error correction model as specified below (Sørensen, 2005).

$$\Delta y_t = A_1(L)\Delta y_{t-1} + A_2(L)\Delta x_{t-1} + \gamma z_t + e_t$$

3.11 Measurement of Dependent Variable

The sustainable performance has been measured based on the research specifications of Galletta et al. (2022) and this study used OLS model. On the basis on the research of Galletta et al. (2022) the choice of proxies and measurement procedure (Table 3.1) for the dependent variables (sustainable performance) are taken as (1) financial performance, (2) social performance, and (3) environmental performance as dimensions of banks. As suggested by Galletta et al. (2022), for first proxy, we used the ROA as a financial performance indicator, measuring banks' ability to generate returns on their assets. The financial performance (FP) is based on the Return on Asset (ROA) that is calculated as:

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$$

To test our second set of proxy, we used stakeholder engagement as a proxy for the dependent variable indicating social performance. It is computed as a dummy variable that

equals one if a bank conveys information on how it engages with its stakeholders and zero otherwise (Batae et al., 2021). Along with other polluting industries, financial institutions are involved in environmental responsibility (Galleg et al., 2019; Galletta et al., 2021). we used emission reduction for environmental performance which is third proxy. It is determined by considering a dummy variable equals one if a bank has a policy to reduce its emissions and zero otherwise.

The three factors were measured independently and then a singular index value, based on averages, was created, where mean values were calculated to create a singular value for the dependent variable. Once data relating to all three dimensions was developed, an index was generated for these proxies by taking an average for the value of each year by following the formula.

$$SP = \frac{FP + Sp + EP}{3}$$

While *SP= Sustainable Performance*, *FP= Financial Performance is ROA*, *Sp= Social Performance*, *EP= Environmental Performance*.

The above variables were transformed into the continuous variable to run OLS, and proxies were taken as averages to measure the variables as combined. As SP was measured through continuous variable ROA as financial performance and dummy variables of environment and social performance were taken as 0 or 1, then the average of the proxies has been taken as combined for SP sustainable performance. Once data relating to all three dimensions was developed, an index was generated for the variable by taking an average for the values of each year.

3.12 Measurement of Independent Variables

3.12.1 Internal Factors

3.12.1.1 Efficiency

Efficiency means achieving the maximum ratio between output and input during product development, necessitating the best resource distribution to achieve maximum potential (Alber et al., 2019). The efficiency of the banking sector means efficient implementation of external policies by generating sustainable developments, social welfare, and economic growth, ensuring profit maximization and cost minimization (Pereira & Marques, 2021). In the present study, the efficiency of banks has been considered an internal factor, and its influence on the sustainable performance of banks has been assessed. In the present study, efficiency was based on the DEA method, and Fixed Assets, Equity, and Short-term funding and deposits were inputs, while Net income Securities and loans were outputs. The DEA model is specified below with “m” input variables which were fixed assets, short-term funding, deposits, and equity and loans and net income securities were outputs specified by “u” and “v” represented DMUs, the envelopment of the input model as suggested by (Charnes et al. 1978) and Cooper et al. (2007):

$$\max h_0(u, v) = \sum_r u_r y_{r0} / \sum_i v_i x_{i0}$$

where

$$\sum_r u_r y_{rj} / \sum_i v_i x_{ij} \leq 1 \text{ for } j = 1, \dots, n,$$

$$u_r, v_i \geq 0 \text{ for all } i \text{ and } r$$

3.12.1.2 Profitability

The profitability of banks assists the policymakers in knowing the financial performance of banks. Profitability means the ability of the business to give a return on

investment based on the resources used compared to an alternative investment. The profitability of banks measures the profitability of banks through return on asset (ROA) and return on equity (ROE) (Beck et al., 2013).

ROE is achieved by dividing net income by shareholders' equity (Guillén et al., 2014). $ROE = \text{Net Income} / \text{Total Equity}$

NIM is the net interest margin to total assets earnings. Higher NIM results in valuable investments and better interest revenue.

3.12.1.3 Risk Management Capability

A bank's risk management capability can also be termed as a bank stability to withstand bankruptcy risks and heavy losses, to measure risk management capabilities by Z-Score (Ghosh, 2014) Boyd, Graham, and Hewitt (1993), and Capital ratio, i.e., equity to total asset ratio (Horváth et al., 2014).

The formula shows the ratio of assets to liabilities, i.e. how many times a company can pay off its current liabilities with its current assets. The working capital ratio is

$\text{Capital Ratio} = \text{Current Assets} / \text{Current Liabilities}.$

Boyd et al. (1993) developed a Z-score and measured statistically the probability of bankruptcy of banks and other organizations. The banks with better risk management capability have high Z-scores and are less prone to bankruptcy. Altman Z-Score = $1.2A + 1.4B + 3.3C + 0.6D + 1.0E$

Where:

A = working capital / total assets

B = retained earnings / total assets

C = earnings before interest and tax / total assets

$D = \text{market value of equity} / \text{total liabilities}$

$E = \text{sales} / \text{total assets}$

3.12.2 External Factors

3.12.2.1 Gross Domestic Product (GDP)

Gross domestic product (GDP) is the standard measure of the value added created by producing goods and services in a country during a certain period. The GDP growth is the leading indicator of the economic condition; the economy and sustainable performance of banks improve with GDP growth. Therefore, banks focus on countries with better GDP for investment purposes. These investment decisions include increasing the operation of more branches, capitalization, or mergers and acquisitions. Some other studies drew similar conclusions (El Moussawi & Obeid, 2011; Semih Yildirim & Philippatos, 2007; Zhang et al., 2012). However, some studies find no significant impact of GDP on sustainable performance (Abu-Alkheil et al., 2012b).

3.12.2.2 Inflation

Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country.

3.12.2.3 Exchange Rate

An exchange rate is the value of one nation's currency versus another nation's or economic zone's currency. An exchange rate is an important feature of the international trade of a nation, economic performance, and balance of payments. A foreign exchange rate is the price at which one currency may be converted into another. During a fiscal year, the average exchange rate is used to measure the exchange rate. Chowdhury and Rasid (2016) suggested

that foreign exchange rates should be essential for banks' profitability and sustainable performance.

3.12.2.4 Interest Rate

The interest rate is the amount you are charged for borrowing money, shown as a percentage of the total amount of the loan. Prior studies reported mixed evidence of the effect of interest rates on banks' sustainable performance. Rashid and Jabeen (2016) reported a negative effect of interest rates on banks' sustainable performance, While Yahya et al. (2014) found a positive effect. The interest rate is the amount paid on the principal by the borrower to the bank or the lender. The general market situation and the bank's performance increases rapidly with an increase in banks' interest rate (Shiller & McCulloch, 1987).

3.13 Measurement of Control Factor

3.13.1 Bank Size (Control Variable)

Bank size has been taken as the primary variable in many studies on profitability, efficiency, risk management, and sustainable performance and found a positive, negative, or no impact on these variables. Some researchers suggest that large-size banks are profitable, efficient, less averse to risk, and sustainable. Few studies suggest that smaller banks achieve better efficiency (Ariff & Luc, 2008; El Moussawi & Obeid, 2011; Hasan & Marton, 2003). Many studies observed that the size of banks influenced their efficiency either positively or negatively (Sufian, 2009; Tan & Floros, 2013). In contrast, certain studies conclude that bank size has an insignificant relationship with efficiency (Garza-García, 2012; Wanke & Barros, 2014).

According to Krishna et al. (2021), bank size positively and significantly impacts banks' financial sustainable performance. The results and findings of Houston et al. (2010),

Bertay et al. (2013), and Chronopoulos et al. (2015) are also in line with Krishna et al. (2021). In contrast, David and Alhadeff (1964) found that bank size hurts the financial sustainable performance of banks. Few other researchers also support the findings of David and Alhadeff (1964), such as De Haan and Poghosyan (2012) and Petria et al. (2015). In contrast, Quan et al. (2019) suggest that the banks' size has no significant impact on banks' profitability. After achieving some level of profitability, the banks' size experiences a reduction in profitability, whereas the smaller banks start gaining more profitability compared to larger banks (Berger, 1995). Similarly, Curak et al. (2012) and Tan and Floros (2013) reveal that banks' size is irrelevant to profitability.

According to Tabak et al. (2015), a positive and significant relationship exists between banks' size and risk management capability. Banks with large sizes are more stable than smaller ones. Whereas Nguyen et al. (2012), Srairi (2013) and Cubillas and González (2014) also found a positive relationship between bank size and its risk management capability. Alharthi's (2016) results suggest a negative and significant relationship between bank size and Z-score, and the bank size decreased capital ratios for Islamic banks (Alharthi, 2016). The researchers also found a negative relationship between bank size and risk management capability (Ghosh, 2014; Köhler, 2015; Williams, 2014). Krishna et al. (2021) conducted a study on "determinants of bank profitability: empirical evidence from a small Pacific island developing state," the study results show that risk and bank size have a positive relationship with the performance of the performance banks

3.13.2 Loan Intensity (Control Variable)

One of the main functions and the bank's primary role is to provide loans. Most studies suggest that more loans increase banks' sustainable performance (Pasiouras, 2008;

Semih Yildirim & Philippatos, 2007; Sufian, 2009). Some researchers state that more loan makes a bank more prone to risks (Noor & Ahmad, 2011).

The loan intensity significantly and positively impacts banks' profitability. A study on Chinese banks concludes that more loans result in higher profits (Lin & Zhang, 2009). Chronopoulos et al. (2015) state that reduced loans result in more profits. The loans increase risk-taking and decrease the bank's risk management capability (Berger, 2009). In contrast, a study reveals that banks with higher loan intensity have high z-scores (Köhler, 2015).

3.13.3 Financial Leverage (Control Variable)

Financial leverage has been studied as a variable of efficiency (Abu-Alkheil et al., 2012). In the first step, his study investigated the efficiency of banks in the UK, Malaysia, GCC, and Turkey from 2005 to 2008. At the same time, the second step evaluated the determinants and variables that had an impact on efficiency and sustainable performance. Abu-Alkheil et al. (2012) suggested a negative and significant relationship between DEA scores and financial leverage.

Abu-Alkheil et al. (2012) examined the relationship between financial leverage and the financial sustainable performance of Jordanian banks from 2004 to 2016. They found that financial leverage is an essential determinant of financial sustainable performance. The financial leverage negatively and significantly impacted banks' sustainable financial performance (Abu-Alkheil et al., 2012; Sikandar et al., 2021).

3.13.4 Credit Risk (Control Variable)

Lee and Chih (2013) investigated the efficiency of large and small banks in China from 2004 to 2011. The study suggests that credit risk, which is the loan-to-deposit ratio, impacts efficiency and sustainable performance negatively and significantly in smaller

banks. Therefore, to raise efficiency, the banks must concentrate on increasing loans. Hou et al. (2014) find the exact relationship between efficiency and credit risk. In contrast, Ariff and Luc (2008) conducted a study on Chinese banks from 1995 to 2004 and found opposite results. The study suggests that efficiency is badly affected by more lending. This study is similar to the study conducted on the Chinese banking sector from 1999 to 2008 (Zhang et al., 2012).

Credit risk influences Pakistani banks' profitability and sustainable performance negatively and significantly (Saghir & Ch, 2020). In addition, it was revealed that the fewer the non-performing loans, the lower the risk factor experienced. The financial risk comprising credit and liquidity risk tends to significantly impact the overall enactment of commercial banks in Pakistan (Saghir & Ch, 2020). A significant increase in loans increases return on equity. The loan-to-deposit ratio is negative to return on equity (Chitan, 2012).

The risk-taking behaviour and liquidity are vital to calculating the risk management capability of banks, and the banks with stable liquidity are highly risk-taking banks (Abbas et al., 2021). There is a negative correlation between loan-to-deposit ratios and z-scores; the banks are liable to take less risk with an increase in the loan-to-deposit ratio, resulting in sustainable performance (Lee & Chih, 2013). There is no relationship between the loan-to-deposit ratio and z-score (Dong et al., 2014). A positive relationship exists between credit risk and banks' risk management capability and sustainable performance (Jeon & Lim, 2013). A significant negative relationship has been observed between banks' risk management capability and credit risk (Matey, 2021).

The Table 3.1 presents the final measurement proxies for the variables used in the current study.

Table 3.1: Measurement Proxies for the Variables

Type	Variables	Dimensions	Proxies
Dependent Variable	Sustainable Performance	Financial Performance Environmental Performance Social Performance	Financial performance is measured as return on assets. Environmental Performance is a dummy variable; if the firm is publishing it, it is coded as 1; otherwise, 0. Same as 1 coded for those firms that published social reports otherwise 0.
Independent Variable (Internal Factors)	Efficiency	Data Envelopment Analysis (Input variables and Output variables)	Based on the DEA method, selected Fixed Assets, Equity, and Short-term funding & Deposits, as inputs, while Net income Securities and loans are outputs.
	Profitability	ROE NIM	ROE is calculated as net income divided by shareholders' equity, while NIM is calculated as net interest income divided by total earning assets.
	Risk management Capability	z- score Capital Ratio	z-score was calculated based on the following formula $Z - score = \frac{ROA+E/TA}{S.D.ROA}$

Table 3.1 continued

			While the capital ratio was measured as equity divided by total assets.
Independent Variable (External Factors)	GDP		These are the national-level data-based variable; their proxy and data were taken as measured and provided by the World Development Indicators (WDI).
	Inflation		
	Exchange Rate		
	Interest Rate		
Control Variables	Size		Size as the natural logarithm of total assets. Credit Risk is measured as the Loans to deposits ratio. Loan Intensity is measured as the loans over total assets ratio, while Leverage is measured as the total assets to equity ratio.
	Credit Risk		
	Loan Intensity		
	Leverage		

3.14 Ethical Considerations

Fleming and Zegwaard (2018) suggest that ethical considerations besides suitable research methodology and strategy are vital in the research process. The researcher must consider and plan to manage ethical issues: risk of harm, informed content, confidentiality, conflict of interest, and anonymity (Fleming & Zegwaard, 2018). The required ethical considerations were considered throughout the research to safeguard the interest of the university, researchers, and Pakistan's banking sector. The Security and Exchange

Commission of Pakistan (SECP) was informed to extract the Pakistani Banking Sector data from the State Bank of Pakistan and other banks' websites (Appendix III). The purpose of the research was explained in the email, including the research title and participants' involvement.

3.15 Chapter Summary

This chapter provides the guidelines for the research methodology adopted for the current research. Researchers gain the guidelines from the research onion proposed by Saunders et al. (2007). Every step toward concluding the research is explained in detail in this chapter; the researcher first discusses the research philosophy and approaches and then establishes the roadmap to complete the process. Moreover, the researcher provides the data extraction and calculation methods, estimation techniques, and comments on ethical considerations during this research.

CHAPTER 4

RESULTS AND ANALYSIS

4.1 Overview

This chapter presents the findings from the data analysis as explained in the previous chapter. The data was collected from 32 banks; further details are available in the appendix. Since the study was completed using secondary data from banks' financial statements and databases such as World Development indicators, econometric methods were implemented to analyze the interrelationships among internal and external factors for the bank and their sustainable performance. Initially, the descriptive analysis is discussed, and then the unit root test and other preliminary tests such as cointegration and cross-sectional dependence are verified. Once the preliminary analysis is complete, the study applies multivariate regression techniques such as Panel OLS or pooled OLS and random and fixed effects modelling for robustness analysis. Normality tests were also done to evaluate the normality of the error terms. The status of the research hypotheses formulated in the second chapter is also discussed.

4.2 Descriptive Analysis

Descriptive statistics involve descriptive coefficients summarizing a data set representing the entire population or a specific sample related to a population (Lawless et al., 2010). The table below showcases the descriptive summary of the indicators and their mean and median values, maximum and minimum values, and standard deviation. Furthermore, the table also represents the normality of the data through the depiction of skewness and kurtosis and the total number of observations.

Table 4.1: Descriptive Analysis

	Dependent Variable	Internal Factors (Independent Variable)					External Factors (Independent Variable)				Control Variables			
		EFF	Profitability		Risk Management Capability		GDP	INF	ERATE	IRATE	FSIZE	CRISK	LOAN	LEV
	SP		ROE	NIM	CRATIO	Z_SCORE								
Mean	0.912228	-0.444330	0.730459	9.26E-05	0.071058	18.52202	3.425358	6.649381	128.7846	4.403423	2.711581	-0.013857	3.753936	2.679824
Median	0.893555	-0.397966	0.647340	3.87E-05	0.067148	11.66521	5.526736	5.078057	121.8241	4.034695	2.709807	-0.012584	3.772624	2.700851
Maximum	1.260468	0.160331	1.730231	0.000293	0.151688	63.68087	5.836417	10.57836	161.8385	8.321459	2.751120	-0.000550	4.410699	3.397860
Minimum	0.721512	-1.608613	0.339035	2.97E-05	0.033445	2.081513	-0.935390	3.765119	104.7691	0.559597	2.679609	-0.034962	3.085147	1.885928
Std. Dev.	0.102463	0.346785	0.294847	9.42E-05	0.019783	17.99092	2.800848	2.919496	23.36970	2.619225	0.014640	0.007754	0.270516	0.264205
Skewness	0.968188	-1.083960	1.552313	1.229448	1.050998	1.435139	-0.568239	0.368683	0.297788	0.055957	0.266544	-0.583974	-0.126221	-0.300932
Kurtosis	4.558346	4.895483	4.865776	2.647727	4.499761	3.687098	1.522050	1.249042	1.377574	1.986398	2.372473	3.052067	2.442988	2.839683
Jarque-Bera	41.18661	55.28486	87.46549	41.13508	44.45115	58.07065	23.17279	24.06375	19.91318	6.932753	4.519828	9.112100	2.493264	2.586271
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000009	0.000006	0.000047	0.031230	0.104359	0.010503	0.287471	0.274409
Sum	145.9564	-71.09286	116.8735	0.014819	11.36923	2963.524	548.0573	1063.901	20605.54	704.5477	433.8529	-2.217065	600.6298	428.7719
Sum Sq. Dev.	1.669302	19.12129	13.82260	1.41E-06	0.062226	51464.04	1247.315	1355.230	86836.74	1090.794	0.034079	0.009560	11.63546	11.09892
Observations	160	160	160	160	160	160	160	160	160	160	160	160	160	160

The above table represents the proxies selected for the depiction of profitability and risk management, and efficiency is the average value of the index calculated for the efficiency of Pakistani banks. Where:

SP = Sustainable Performance (Dependent Variable)

Eff = Efficiency (Internal Factor)

ROE=Return on Equity (Proxy of Profitability, which is Internal Factor)

NIM = Net Interest Margin (Proxy of profitability, which is Internal Factor)

CRATIO = Capital Ratio (Proxy of Credit Risk Management Capability which is Internal Factor)

Z-Score = Proxy of Credit Risk Management Capability, which is Internal Factor.

GDP = Gross Domestic Product (External Factor)

INF = Inflation (External Factor)

ERATE = Exchange Rate (External Factor)

IRATE = Interest Rate (External Factor)

FSIZE = Bank Size (Control Variable)

CRISK = Credit Risk (Control Variable)

LOAN = Loan Intensity (Control Variable)

Lev = Leverage (Control Variable)

Descriptive statistics are important to have a look at the summary of the descriptive statistics of the variable before processing to the econometric estimation. It is necessary as these statistics give the summarized overlook of the properties of the variables in the models briefly. According to the values presented in the above table, the mean values for the variable's sustainable performance, profitability, efficiency, and risk management practices are between the maximum and minimum values. This table shows that no value for these

variables is significantly high or significantly low, representing that all values lie between the maximum and minimum value range, so there are no outliers or extreme values in the data. Furthermore, the values for standard deviation and skewness represent that no value in the data is abnormal, and the data is entirely normal except for sustainable performance and it is because of index measurement. The outcomes present positive results for the normality of data, whereas the total observations were 160 as data was collected from thirty-two banks for five years ($32 \text{ banks} \times 5 \text{ years} = 160$).

One of the important measures of the data is central tendency which focus on the middle values and dispersion of data sets with its position of the distribution of data around mean. Mostly data sets are analyzed through the frequency of each data point in the distribution and describes it using the mean, median, or mode, measuring the patterns of the analyzed data sets. The mean value of the variables described in the table 4.1 are interpreted as the mean is the average of all 160 observation values. The mean value is calculated by the sum of all values by the total no of values of all variables.

As the GDP shows the mean value of 3.4253 and while its median value is 5.526 shows that half the values of the GDP fall below 1.285, while the other half are above that number. The Standard Deviation value GDP is 2.800848 which mean that the data values clustered around the mean. While the value of credit ratio mean is 0.071058 and its median is 0.067148 meaning that the median is nearest to the minimum value 0.033445 and it is near to the mean value. Efficiency has a mean value of -0.444330 and its median is -0.397966 which means it is closer to the minimum value that is -1608613. The standard deviation is slightly harder to interpret. It tells us how tightly the data values are clustered around the mean.¹ The standard deviation of 4.29 means that about 68% of the data values fall between plus or minus 4.29 of the mean of 0.96, which is within one standard deviation. Similarly,

95% of the data values fall between two standard deviations of the mean, or between plus or minus 8.58 of the mean.

For normal distribution measure of for symmetry of data sets, if the value of skewness is zero it is perfectly normal distributed while the if its value is greater than zero then it positively distributed and if the value is negatively distributed and less than zero. The negative value is higher than the left tail of distribution is larger than right side. The skewness values are shown in the table 4.1. The skewness ties in with the mean-median relationship. Another important value is the Kurtosis, which explains the tails of the distribution, whether it is heavy or lighter tail. Data sets having higher values have heavy tails and with lower values have thinner tail. The value of perfect Kurtosis is zero. The skewness, also involves the tails of the distribution. Kurtosis is a measure of whether the datapoints are heavy-tailed or light-tailed relative to a normal distribution. Datasets with higher Kurtosis have heavier tails than datasets with lower kurtosis. In a perfect normal distribution, the Kurtosis is zero. The descriptive statistics in table 4.1 show the values of Kurtosis of variables. The acceptable value of Kurtosis is three if the curve is normal. If it is greater than three it is hepatotactic and lower than three means the platykurtic.

Another assumption of the normality of data is the Jarque-Bera p-value. We have two hypotheses one is null and the other is alternative hypotheses. If $p \leq 0.05$ then the we reject the null hypotheses and accept the alternative hypotheses data is normally distributed and if the value of p is greater than 0.05 then we accept the null hypotheses. The value of Jarque-Bera (p-values) is given in the table 4.1. The sum and sum square deviation show the total of the all values and square of the sum of all data of variable. The observations show the total no of values of the variables used; in this it is 160 observations as shown in the table4.1.

According to the values presented in the above table, the mean values for the variables' sustainable performance, profitability, efficiency, and risk management practices are between the maximum and minimum values. This table shows that no value for these variables is significantly high or significantly low, representing that all values lie between the maximum and minimum value range, so there are no outliers or extreme values in the data. Furthermore, the standard deviation and skewness values represent that no value in the data is abnormal. The data is entirely normal except for sustainable performance, and it is because of index measurement. The outcomes present positive results for the normality of data, whereas the total observations were 160 as data was collected from 32 banks for five years.

4.3 Unit Root Test

The next test applied to evaluate the correctness of the data was the unit root test. The unit root test informs of the integration order of the variables. Also, it informs if stochastic trends are prevalent in the data, i.e., it informs whether the data is stationary or not and therefore establishes the appropriateness and suitability of the data. as the study involves panel data from different private, international, and public sector banks operating in Pakistan. Another reason for applying the unit root test is to evaluate whether the data exhibits signs of serial correlation, i.e., variables are associated with their own differenced versions. It is vital to map out the integration order of the variables so that any diagnostic issues in the data can be examined before cointegration and regression tests are applied since the presence of unit root in the data leads to spurious regressions (Gujarati, 2022). There are several unit root tests such as the ADF, IPS, and PP tests (Alam et al., 2021); however, the stationarity of the variables was estimated via the LLC or the Levin Lin Chu test. LLC is among the most commonly used tests for panel data as it combines the advantages of group-

specific and individual tests such as the ADF and Fisher tests. The LLC also accounts for cross-sectional dependence and presents robust results, which is a common problem in panel data. Thus, the LLC test was chosen and used in the study, and the findings from the test have been presented in Table 4.2. Evidently, all variables were integrated at levels I(0) and I(1). Also, stationarity issues were not present in the data as all variables show that unit root was not present.

Table 4.2: Unit Root Tests

	I(0)	I(1)
CRATIO	-4.67***	-34.1011**
CRISK	-7.08859***	-29.9125***
EFF	1.69086	-428.196***
ERATE	5.86984	-12.2907***
FSIZE	-6.99701**	-1290.35***
GDP	7.89009	-8.63137**
INF	-2.77136**	-13.3723***
IRATE	-5.83309**	-23.2343***
LEV	-5.20401**	-37.3296***
LOAN	-26.7098***	-56.0822***
NIM	-40.7637***	-12.3135***
ROE	-0.89147	-37.9889***
SP	-27.3957***	-13.4049***
Z_SCORE	-30.9679***	-13.8081***

*Means significance level 1%, ** Means significance level 5% and *** means significance level 10%

4.4 Cross-Sectional Dependence Test

The next test before applying the regression analysis was the cross-sectional dependency test. The present study evaluates the company-level (internal) and country-level (external) factors on the sustainable performance of banks within Pakistan. The study sampled private and public-sector banks and included data from international franchises operating in Pakistan, such the Bank of China and Deutsche Bank AG. The determinants for sustainable performance were adopted from the literature, and efficiency, profitability performance, and risk management capabilities were included as organizational internal factors. In contrast, economic development (GDP), inflation, exchange rate, and interest rate were considered external or country-level factors. Since the banks operate in the same country and under the governance of similar conditions and regulations, the values of one could influence the values of the other banks (cross-sectional dependence), which is a common problem observed in panel data and can lead to inaccurate results (Pesaran, 2015; Pesaran, 2021). Another reason for the occurrence of cross-sectionality can be the effect of unobserved factors on the variables. Also, the presence of common shocks, i.e., common factors that influence the variables, can lead to cross-sectional dependence (Bailey et al., 2016; Pesaran, 2007). Thus, the cross-sectional dependence test was conducted, and the findings are reported in Table 4.3. Table 4.3 indicates three tests, i.e., the Breusch-Pagan LM test, the Pesaran scaled LM test, and the Pesaran CD test. As the tests indicate, the null hypothesis of the test, i.e., cross-sectional dependence is not present in the model, was accepted since $p < 0.00$. Thus, it was concluded that the variables did not exhibit any signs of cross-sectional dependence, and therefore, further testing can be performed.

Table 4.3: Cross-Sectional Dependence

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	948.2548	496	0.0000
Pesaran scaled LM	13.34310		0.0000
Pesaran CD	-1.124380		0.2609

4.5 Cointegration Test

Once the stationarity of the data has been established and the presence of cross-sectional dependence has been negated, the next step in the preliminary testing process is the cointegration analysis. The cointegration analysis is performed for two reasons: to establish cointegrating relationships among the variables and to evaluate the presence of long-run associations. The Kao and Pedroni cointegration test was used for the evaluation, and it can be seen that the test results were significant. Thus, the variables were found to be cointegrating as well. These findings imply that there will be a significant association between the predictors and sustainable bank performance.

Table 4.4: Contigeration Test

	t-Statistic	Prob.
ADF	-7.106182	0.0000
Residual variance	8.98E-06	
HAC variance	7.50E-06	

4.6 Correlation Analysis

A correlation test or analysis is a method of statistical analysis or evaluation that is utilized and applied to analyze and study the strength of the relationship between two continuous and numerically measured variables. This analysis represents the extent of the impact of two variables being cast on each other; the researcher can significantly establish a

possible connection between two variables with the help of the application of correlation analysis as it can prove whether or not the increasing or decreasing of one variable causes increasing or decreasing impact in the other variable (Bolboaca & Jäntschi, 2006). Correlation can be positive or negative; a positive correlation can be observed when the increase in one variable causes a simultaneous positive increase in the other variable. In contrast, a negative correlation can be observed when the increase in one variable causes a decrease in the other variable.

According to Table 4.5, the correlation between sustainable performance and itself (sustainable Performance) is significant and the strongest as the value is +1; the correlation between sustainable performance and profitability is also significant, strong and positive. Furthermore, there is a correlation between sustainable performance, risk management capability, and efficiency. Furthermore, profitability has a significant correlation with itself (profitability); sustainable performance, it has a significant correlation with profitability, risk management capability, and efficiency, while the association between sustainable performance and external factors is insignificant. The correlation of risk management practices is significant, whereas it has a negative correlation with efficiency, which means that efficiency decreases with the enhancement of risk management capability. Furthermore, the efficiency correlation with itself (efficiency) is significant, which means that the variables have a significant correlation and are good to go for further testing and analysis.

Another facet represented by the correlation table is the lack of multicollinearity among the variables, as none of the IVs showed a correlation association of 0.8 or greater with one another. Thus, multicollinearity is not present in the data.

Table 4.5: Correlation Analysis

	CRATIO	CRISK	EFF	ERATE	FSIZE	GDP	INF	IRATE	LEV	LOAN	NIM	ROE	SP	Z_SCORE
CRATIO	1.000													
CRISK	0.554	1.000												
EFF	0.047	-0.093	1.000											
ERATE	0.042	-0.259	0.039	1.000										
FSIZE	-0.726	-0.749	0.085	0.383	1.000									
GDP	-0.028	0.249	-0.028	-0.952	-0.355	1.000								
INF	0.029	-0.242	0.040	0.961	0.372	-0.929	1.000							
IRATE	-0.035	0.248	-0.039	-0.819	-0.356	0.842	-0.775	1.000						
LEV	-0.984	-0.596	-0.022	-0.014	0.766	-0.002	-0.002	-0.001	1.000					
LOAN	0.687	0.786	-0.131	-0.291	-0.874	0.270	-0.284	0.269	-0.719	1.000				
NIM	-0.147	-0.031	-0.286	-0.260	-0.011	0.271	-0.244	0.237	0.161	-0.027	1.000			
ROE	-0.034	0.003	0.102	-0.145	-0.033	0.143	-0.143	0.124	0.050	-0.067	0.383	1.000		
SP	0.410	0.466	0.131	-0.109	-0.599	0.104	-0.111	0.103	-0.435	0.488	0.017	0.589	1.000	
Z_SCORE	-0.008	0.185	-0.088	-0.012	-0.156	0.011	-0.012	0.012	-0.012	0.200	0.064	0.179	0.277	1

Figure 4.1 represents the Q-Q plots for the data, which are the quantiles of normal distribution for sustainable performance, profitability, efficiency, risk management capability, and external and control variables. This represents the analysis regarding whether or not a specific set of data plausibly comes from some specific theoretical distribution like exponential or normal (Jones, 1994).

If both sets of quantiles come from similar distributions, the researcher can represent points forming an almost straight line. When the line is roughly straight or roughly diagonal, the graph represents that the collected data is normally distributed and there are no extremely high or low values. This table also represents the absence of outliers in the data, whereas if a plot involves skewed normal probability, the collected data is not distributed normally.

Following plot 1 in Figure 4.1, it can be observed that most of the values lie around the diagonal, and most of the values for sustainable performance lie around the diagonal line straight, which represents that most of the values are closely related to each other. No value is extremely high or low. This figure represents that the data is normally distributed for sustainable performance. Furthermore, assessing the plot for profitability, it can be observed that almost all values lie close to the diagonal line, which means all values are closed. No value is extremely high or low, representing the normality of the data and the normal distribution of the values collected against the profitability variable. Slight fluctuation can be observed while assessing the plot for risk management capability; however, the values can be observed to be significantly closed, which means that no value is significantly high or low, and all of the values are extremely close, which means the values are normal. The data is normally distributed for this variable as well. Moreover, lastly, the fourth plot for efficiency can be observed, representing extremely close values lying on the diagonal line,

which means that the values are extremely close, and the data is normally distributed for the variable efficiency.

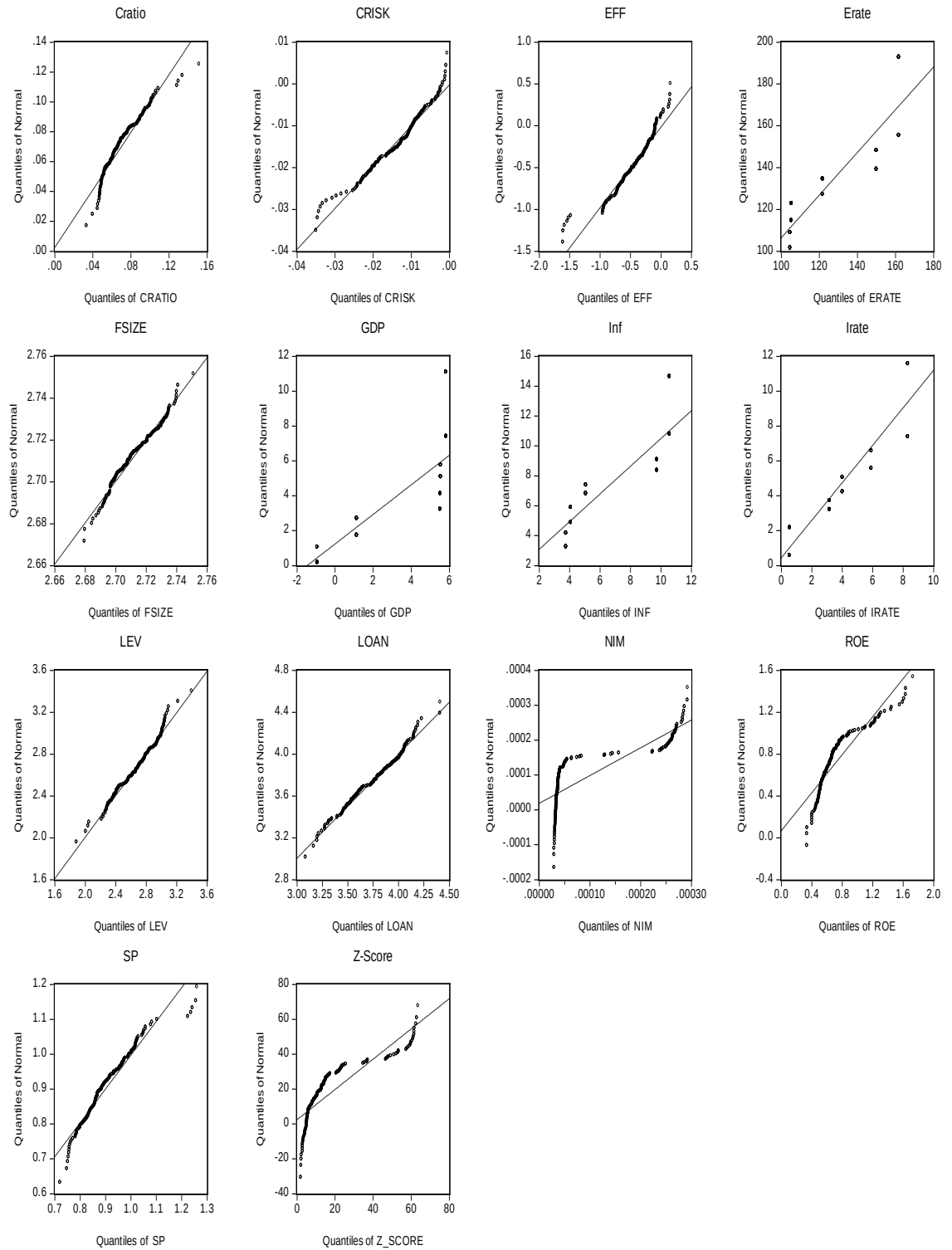


Figure 4.1: Quantiles of Normal

4.7 Regression Analysis

The least-squares method is a statistical analysis and procedure applied to find the best fit for a specific set of data points, with the minimization of the sum of the residuals or the offsets of the points from the curve plotted (Aish & Jöreskog, 1990).

The preceding tests were completed to indicate the absence of problems like stationarity, cross-sectional dependence, and multicollinearity, which can result in the estimation of misleading coefficients. Since panel data was used in the study, the Panel least squares method was used to estimate the research model as presented in the previous chapter.

Table 4.6: Regression Analysis (Panel OLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.43320	1.930573	7.994103	0.0000
CRATIO	-2.001036	1.190439	-1.680923	0.0949
CRISK	0.102586	0.836357	0.122658	0.9025
EFF	0.028662	0.012372	2.316714	0.0219
ERATE	0.001587	0.000767	2.067980	0.0404
FSIZE	-5.429304	0.716679	-7.575645	0.0000
GDP	0.007236	0.005050	1.432845	0.1540
INF	0.000657	0.004907	0.133917	0.8937
IRATE	-0.004154	0.002830	-1.467832	0.1443
LEV	-0.055273	0.095927	-0.576197	0.5654
LOAN	0.036750	0.034004	1.080778	0.2816
NIM	-193.4781	50.10799	-3.861223	0.0002
ROE	0.227696	0.015237	14.94401	0.0000
Z_SCORE	0.000210	0.000234	0.899314	0.3700
R-squared	0.793211	Mean dependent var		0.912228
Adjusted R-squared	0.774799	S.D. dependent var		0.102463
S.E. of regression	0.048624	Akaike info criterion		-3.125949
Sum squared resid	0.345193	Schwarz criterion		-2.856872
Log likelihood	264.0760	Hannan-Quinn criter.		-3.016686

Table 4.6 continued

F-statistic	43.07961	Durbin-Watson stat		0.368606
Prob(F-statistic)	0.000000			

The above table (4.6) indicates that the effect of efficiency on sustainable bank performance was positive and significant. A 1% increase in the efficiency of banks would lead to increased sustainable bank performance by 2.8% ($p < 0.05$). Thus, the hypothesis 1 was accepted. The second hypothesis was related to the banks' profitability and sustainable performance. It was postulated that increasing the profitability of the banks would lead to higher adoption of sustainable directives and, therefore, influence the sustainable performance of the banks. As discussed previously, profitability was measured via two proxies, i.e., ROE and NIM. A 1% increase in ROE would lead to a 22.7% increase in the sustainable performance of the banks; however, an increase in the net interest rate margin would decrease the sustainable performance of the banks by 193 ($p < 0.001$). Since only the positive effect of one of the proxies was confirmed, it can be stated that hypothesis 2 was partially supported. The third internal factor discussed in the study was risk management, which was measured through capital ratio and Z score. The values in Table 14.6 indicate that the effect of the capital ratio and the scoreboard are both insignificant, implying that the banks' risk management capabilities did not have a significant and positive influence on their sustainable performance. The model has an R^2 value of 0.79, indicating that 79% variation was produced in the sustainable performance of the banks by the selected predictors.

Table 4.7 presents the findings from the random effects model. The researchers estimated the Panel OLS model through the specification of fixed and random effects to evaluate the robustness of the estimates. Table 4.7 demonstrates that the result of the random

effect model finding indicates that efficiency has an insignificant impact on bank sustainable performance. In contrast, profitability again has a partially positive and significant impact on Pakistani bank's sustainable performance. The coefficient value of return on equity was 0.15, indicating that a 1% increase in Roe of the banks would lead to 15% increase in sustainable performance. However, the net interest margin had a negative and insignificant influence. Therefore, the profitability that affects the sustainable performance of banks according to the random effects model was partially positive and significant. Risk management capability had an insignificant influence on the sustainable performance of banks according to the random effects model.

In contrast, the external factors of GDP and exchange rate significantly and positively affected banks' sustainable performance. A 1% increase in GDP and exchange rate performance of the country would lead to an increase in sustainable performance by 0.4% and 0.1%. The value of the coefficient of determination for this model was 0.788, indicating that the selected indicators contributed 78.8% of the variation.

Table 4.7: Regression Analysis (RE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.76488	1.158495	11.01851	0.0000
CRATIO	0.613115	0.551653	1.111415	0.2682
CRISK	-0.335108	0.370507	-0.904459	0.3672
EFF	0.001093	0.012973	0.084251	0.9330
ERATE	0.001112	0.000291	3.828607	0.0002
FSIZE	-4.567963	0.417256	-10.94763	0.0000
GDP	0.004434	0.001903	2.330189	0.0212
INF	0.000230	0.001784	0.129160	0.8974
IRATE	-0.002573	0.001054	-2.440315	0.0159
LEV	0.055187	0.044616	1.236935	0.2181

Table 4.7 continued

LOAN	0.016790	0.020007	0.839246	0.4027
NIM	-47.93837	29.94688	-1.600780	0.1116
ROE	0.150807	0.013689	11.01677	0.0000
Z_SCORE	0.001119	0.000467	2.397917	0.0178
Effects Specification				
			S.D.	Rho
Cross-section random			0.046629	0.8759
Idiosyncratic random			0.017552	0.1241
Weighted Statistics				
R-squared	0.788524	Mean dependent var		0.151435
Adjusted R-squared	0.769694	S.D. dependent var		0.042139
S.E. of regression	0.020223	Sum squared resid		0.059707
F-statistic	41.87584	Durbin-Watson stat		0.973906
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.711151	Mean dependent var		0.912228
Sum squared resid	0.482176	Durbin-Watson stat		0.120597

Table 4.8 presents the findings from the fixed effects model. According to the fixed effects model, the effect of the coefficient was negative and insignificant. The effect of profitability through net interest rate margin and ROE was partially significant. At the same time, the influence of profitability through credit ratio and Z score was also found to be partially significant. GDP, exchange rate, and interest rate significantly affect banks' sustainable performance. However, the effect of the interest rate was negative. Therefore, the hypothesis was rejected. The coefficient of determination for this model was 0.99; that is, the selected indicators explained 99% of the variation.

Table 4.8: Regression Analysis (FE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.071066	0.621319	14.59968	0.0000
CRATIO	0.029061	0.402164	0.072262	0.9425
CRISK	-0.427229	0.151832	-2.813827	0.0058
EFF	-0.008314	0.007908	-1.051252	0.2953
ERATE	0.000794	0.000128	6.213686	0.0000
FSIZE	-3.207270	0.221887	-14.45454	0.0000
GDP	0.003388	0.000792	4.280456	0.0000
INF	-8.29E-05	0.000707	-0.117235	0.9069
IRATE	-0.001769	0.000445	-3.975282	0.0001
LEV	0.008013	0.028694	0.279266	0.7805
LOAN	0.017639	0.008947	1.971604	0.0511
NIM	-7.141187	12.75879	-0.559707	0.5768
ROE	0.091040	0.010893	8.357817	0.0000
Z_SCORE	0.014429	0.000912	15.82106	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.994330	Mean dependent var		1.750151
Adjusted R-squared	0.992161	S.D. dependent var		1.206398
S.E. of regression	0.016771	Sum squared resid		0.032346
F-statistic	458.3582	Durbin-Watson stat		1.545437
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.977795	Mean dependent var		0.912228
Sum squared resid	0.037067	Durbin-Watson stat		1.154016

Descriptive statistics in the chapter's initial part show each variable's individual normality. The following diagram shows the overall normality of the final model of this study. Figure 4.2 also represents the normality of the data; the bell-shaped graph represents

the distribution of the data. The least level of fluctuations represents that the data is distributed in a completely perfect bell-shaped trend and does not fluctuate significantly highly or with low values. The value of Jarque-Bera is significant, indicating that this study's overall model is abnormal.

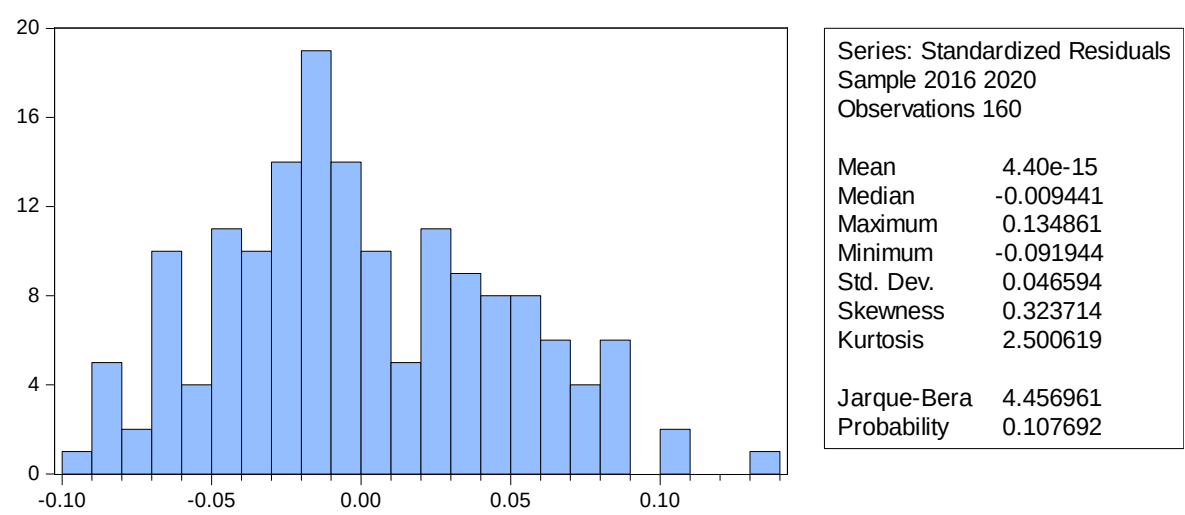


Figure 4.2: Normality

The simple Panel OLS model was re-estimated through the specification of Cross-section weights. The weighted OLS method was used to estimate the simple and fixed effects model, as both showed consistent and efficient results. The weighted OLS method assigns weights based on a particular method, which in this case were the cross-sections, and these weights are considered to increase the reliability of the estimates; the technique is used especially when the model is based on small sample sizes. Increased reliability means that the observations will have a stronger effect and lead to precise estimates.

Table 4.9: Regression Analysis (PEGL - CS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.26171	1.217024	11.71852	0.0000
CRATIO	-1.875512	0.711643	-2.635468	0.0093
CRISK	-0.056945	0.483744	-0.117717	0.9065
EFF	0.020807	0.005403	3.851044	0.0002
ERATE	0.001354	0.000379	3.576008	0.0005
FSIZE	-4.939565	0.463924	-10.64736	0.0000
GDP	0.005630	0.002505	2.247585	0.0261
INF	-0.000660	0.002316	-0.284963	0.7761
IRATE	-0.003634	0.001348	-2.696808	0.0078
LEV	-0.085275	0.055987	-1.523131	0.1299
LOAN	0.023488	0.021267	1.104438	0.2712
NIM	-138.5512	31.10205	-4.454730	0.0000
ROE	0.211666	0.012704	16.66184	0.0000
Z_SCORE	0.000308	0.000115	2.672250	0.0084
Weighted Statistics				
R-squared	0.893818	Mean dependent var		1.423371
Adjusted R-squared	0.884363	S.D. dependent var		1.108641
S.E. of regression	0.045250	Sum squared resid		0.298947
F-statistic	94.53833	Durbin-Watson stat		0.544712
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.782886	Mean dependent var		0.912228
Sum squared resid	0.362429	Durbin-Watson stat		0.283040

The panel EGLS is panel estimated generalized least squares. The results of Panel EGLS (Cross-section weights) indicated that all major variable efficiency, profitability, RMC, and External factors significantly impact a bank's sustainable performance (Table 4.9). At the same time, several predictors were found to have an insignificant effect on the sustainable performance of the banks. In the same way, as the researcher applied the Panel

EGLS (Cross-section weights) with the fixed-effect model, the finding changed. The Panel EGLS (Cross-section weights) with the fixed-effect model are illustrated in Table 4.10.

Table 4.10: Panel Fixed Effects (Cross Sectional Weights)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.071066	0.621319	14.59968	0.0000
CRATIO	0.029061	0.402164	0.072262	0.9425
CRISK	-0.427229	0.151832	-2.813827	0.0058
EFF	-0.008314	0.007908	-1.051252	0.2953
ERATE	0.000794	0.000128	6.213686	0.0000
FSIZE	-3.207270	0.221887	-14.45454	0.0000
GDP	0.003388	0.000792	4.280456	0.0000
INF	-8.29E-05	0.000707	-0.117235	0.9069
IRATE	-0.001769	0.000445	-3.975282	0.0001
LEV	0.008013	0.028694	0.279266	0.7805
LOAN	0.017639	0.008947	1.971604	0.0511
NIM	-7.141187	12.75879	-0.559707	0.5768
ROE	0.091040	0.010893	8.357817	0.0000
Z_SCORE	0.014429	0.000912	15.82106	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.994330	Mean dependent var		1.750151
Adjusted R-squared	0.992161	S.D. dependent var		1.206398
S.E. of regression	0.016771	Sum squared resid		0.032346
F-statistic	458.3582	Durbin-Watson stat		1.545437
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.977795	Mean dependent var		0.912228
Sum squared resid	0.037067	Durbin-Watson stat		1.154016

Table 4.10 indicates the Panel EGLS (Cross-section weights) results based on the fixed-effect model. Our hypotheses are proven, and all the major regressors positively and significantly impact bank sustainable performance. The overall model shows the good indices as the Adjusted R square is .99, which is efficient and good. It is the same as the Durbin-Watson value near 1.54, which is near 2 (Gujarati, 2022) and indicates no autocorrelation problem among the variables as illustrated in Table 4.10.

Finally, as illustrated in Figure 4.3, the revised normality test demonstrated that the overall model now is well and normal, as we can draw a bell-shaped curve, leading to normality. Moreover, Jarque-Bera is 6.07, and the probability value is 0.04, nearing .05; therefore, the overall model is now normal in all aspects.

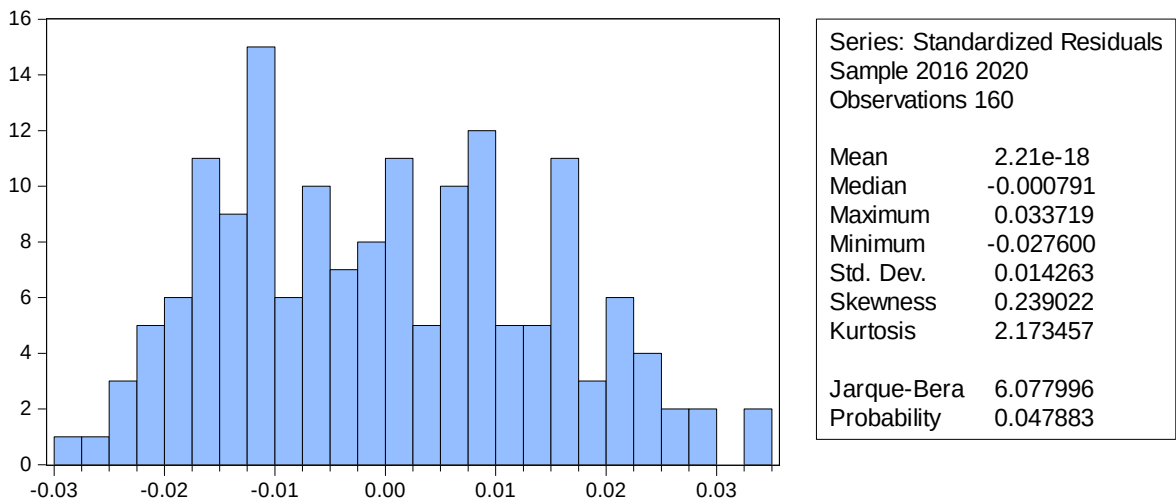


Figure 4.3: Model Normality

Table 4.11 presents an overall summary of the hypotheses formulated in Chapter 2 and indicates the acceptance and rejection status of each based on the discussion above.

Table 4.11: Hypotheses Status

H. No#	Statement	OLS	Status
H1	Efficiency has a significant impact on sustainable performance.	0.020807 (0.0002)	Supported
H2	Profitability has a significant impact on sustainable performance		Supported
	ROE has a significant impact on sustainable performance	-138.5512 (0.00)	Supported
	NIM has a significant impact on sustainable performance	0.211666 (0.00)	Supported
H3	RMC has a significant impact on sustainable performance.		Supported
	Z-score has a significant impact on sustainable performance	0.000308 (0.00)	Supported
	The capital ratio has a significant impact on sustainable performance	-1.875512 (0.00)	Supported
H4	GDP has a significant impact on sustainable performance	0.005630 (0.02)	Supported
H5	Inflation has a significant impact on sustainable performance	(-0.000660) (0.7761)	Not Supported
H6	The exchange rate has a significant impact on sustainable performance	0.001354 (0.00)	Supported

Table 4.11 continued

H7	The interest rate has a significant impact on sustainable performance	-0.003634 (0.007)	Not Supported
-----------	---	----------------------	---------------

4.8 Discussion on Results

This section discusses the study hypotheses regarding their acceptance and rejection. The findings of this study, to meet objectives and its consistency of results with prior studies, have also been discussed.

This study investigates sustainable performance of banks in Pakistan through external and internal factors. For this purpose, the researcher collects yearly data from 32 Pakistani banks from 2016 to 2020. The internal factors include efficiency, profitability, and risk management capability. Banks' efficiency is measured in terms of technical efficiency, pure technical efficiency, and scale efficiency, whereas profitability has two dimensions: return on equity and NIM. The same risk management capability is measured with capital ratio and z-score, while in external factors, the researcher uses the GDP, inflation rate, interest rate, and exchange rate.

In contrast, this study's control factors are leverage, credit risk, bank size, and loan intensity. According to Hongbo and Fangfang (2010), the Contingency Theory suggests that management must consider internal and external factors for economic organization. The researcher considered internal and external factors for the sustainable performance of banks and found their significant impact on sustainable performance. In the literature available on sustainable performance, few variables were considered. In contrast, according to Ong et al. (2019), the contingency theory, specific organizational characteristics, and their sustainable

performance cannot be measured with one odd measurement process; rather, comprehensive and contextual procedures influence an organization. Therefore, this study used the contingency theory to determine the association between internal and external factors and the sustainable performance of banks in Pakistan. At the same time, the ESG model was also utilized to understand better the economic, governance, and social performance of the banks in Pakistan to determine their sustainable performance.

Researchers use the OLS method through random, and fixed effect models to determine the relationship of internal and external factors with sustainable performance of banks in Pakistan. Findings indicate that all internal factors significantly impact the sustainable performance of banks in Pakistan. In contrast, within the context of external factors, inflation and interest rates have an insignificant impact on the sustainable performance of banks in Pakistan, while exchange rates and GDP significantly impact the sustainable performance of banks in Pakistan.

4.9 Impact of Internal Factors on Sustainable Performance of Banks

In order to address research objective 2, internal factors' impact on the banks' sustainable performance in Pakistan was observed. The internal factors include efficiency, profitability, and risk management capability.

4.9.1 Impact of Efficiency on Banks' Sustainable Performance

The first hypothesis of study states that efficiency has a significant impact on sustainable performance of banks in Pakistan. Findings indicate that efficiency ($\beta = 0.0208$, $p = .000$) has a 2.08% positively impact banks' sustainable performance as the β value is 0.0208 and the p -value is 0.00. Hence, it is proved that the first hypothesis of this study is accepted, and these results are also related to the study's first specific objective.

These results are similar to those of Pampurini and Quaranta (2018). The efficiency level, financial intermediary, and bank production process are strongly interrelated with sustainable performance (Pampurini & Quaranta, 2018). The results of this study are related to the results of Marie et al. (2014). Another study proved that sustainable performance is associated with efficiency (Pampurini & Quaranta, 2018). Sustainable performance depends on the efficiency and the organization's economic system (Scholtens & van't Klooster, 2019).

The results confirm the findings of researchers who also brought the same findings. A few similar results are: The corporation with steady, sustainable performance through social, environmental, and financial performance attains reduced litigation, reduction in cost, and better operational efficiency Malsha et al. (2020). The firm efficiency increases sustainable performance (Portillo-Tarragona et al., 2018). The bank's efficiency is a measure of attaining sustainable performance of banks (San-Jose et al., 2018).

In contrast, Nidumolu et al. (2009) state that if a bank emphasizes environmental investments, it may lose efficiency, affecting its sustainable performance (Nidumolu et al., 2009). In contrast, Sadjadi et al. (2022) conclude that banks' management efficiency has a moderate relationship with the sustainable performance of Irani banks (Sadjadi et al., 2022).

The results of this study are in contrast to the results of Ait Sidhoum et al. (2022), who analyzed trade-offs among economic, social, and environmental sustainability. Technical efficiency was utilized as a proxy of economic sustainability, and the research determined an association between technical efficiency and sustainable performance (Ait Sidhoum et al., 2022). The same dissimilarity was found in the study of Alem (2021), who used a stochastic approach and evaluated the role of technical efficiency as the environmental variable to achieve sustainable performance. A significant relationship exists

between technical efficiency and sustainable performance (Alem, 2021). Hepelwa (2013) had the opposite results. Higher technical efficiency enhances sustainable performance. Therefore, to improve sustainable performance, there is a need to increase technical efficiency.

Findings are coherent with the previous studies reviewed with similar results. Shah et al. (2019) analyzed the relationship between efficiency and sustainable banks using data envelopment analysis (DEA) and assessed the relationship between non-sustainable banks and efficiency. Pure technical efficiency significantly influences sustainable banks, whereas PTE has an insignificant impact on non-sustainable banks (Shah et al., 2019). Dia et al. (2020) analyzed efficiency's relationship with sustainability, and the study suggested improving pure technical efficiency to increase sustainable performance in the Canadian banking sector (Dia et al., 2020).

The previous studies reviewed in the literature have dissimilar results. Pereira and Marques (2021) conducted a study on sustainable performance in Brazil. They used a two-stage data envelopment analysis approach to measure the scale efficiency of municipalities of Brazil to ascertain the relationship with sustainable performance. A significant relationship exists between SE and sustainable performance (Pereira & Marques, 2021). Similarly, Xu and Zhou (2021) used panel data from 2011 to 2018 to evaluate the sustainable performance and green innovation efficiency of eight Chinese economic areas by categorizing these economic areas into scale efficiency and pure technical efficiency. The authors found a significant relationship between green innovation efficiency (sustainability) and scale efficiency (Xu & Zhou, 2021). Likewise, Li et al. (2021) state that an organization enhances sustainable development by improving scale efficiency, resulting in sustainable performance (Li et al., 2021).

4.9.2 Impact of Profitability on Banks' Sustainable Performance

The current study measured profitability as return on equity and NIM; however, hypothesis 2 proposed that overall profitability significantly impacts a bank's sustainable performance. It is confirmed through statistical findings based on the ordinary least square. Therefore, it is confirmed that the H2 of the study is accepted. Findings are consistent with the study of Sadjadi et al. (2022), who conducted research on 23 banks in Iran from 2011 to 2018, and the results suggest that profitability contributes to the sustainable performance of banks. Similarly, the study on "factors affecting the sustainable performance of financial institutions in Bangladesh" found a relationship between profitability and sustainable performance (Zheng et al., 2021). Phan et al. (2020) also identified a positive relationship between profitability and sustainable development practices.

The current study results are coherent with Alshehhi et al. (2018), who shortlisted 132 high-rated and peer-reviewed research papers and analyzed the relationship between sustainable and financial performance. 78% of shortlisted research publications suggest a positive relationship between corporate sustainable performance and financial performance. 6 % of shortlisted publications have a negative, 7 % have no impact, whereas the remaining percentage has a mixed impact on sustainable performance.

In the same way, Torugsa et al. (2013) suggest that sustainable performance practices reduce firms' costs through energy-saving and other resources, cost of product return, and liabilities fees, resulting in improved firms' financial performance (Torugsa et al., 2013). Similarly, Davies and Crane (2010) also established a significant relationship and stated that sustainable social practices contribute to cost reduction linked with employee training and recruitment, resulting in better financial performance. A significant relationship has also

been identified between sustainable performance and the financial performance of firms (Leonidou et al., 2015).

In contrast, Nollet et al. (2016) found a negative relationship between corporate social performance and financial performance, suggesting that sustainable performance and financial performance are negatively related. The literature has mixed results on the relationship between sustainable and financial performance. Few researchers state that a unidirectional and generalizable relation applicable to different organizations does not exist (Grewatsch & Kleindienst, 2017). However, most previous studies indicate a positive relationship between sustainable performance and financial performance (Van Beurden & Gössling, 2008).

The first indicator of profitability is ROE. Regression findings concluded that ROE significantly impacts banks' sustainable performance as results are (beta= $-.138$, $p < .05$) based on OLS, respectively.

Similarly, Jyoti and Khanna (2021) conducted a study to measure the relationship between sustainable performance and the financial performance of companies. The results of the study indicate a negative relationship between the social score of sustainable performance with return on asset (ROA) and return on equity (ROE) (Jyoti & Khanna, 2021). Whereas Schabek (2020) measured the relationship between sustainable performance and companies' financial performance utilizing panel regression using ROE. Public companies' profitability measured by ROE experiences low sustainable performance. Another study also found a negative relationship and stated that the ROA and ROE decrease by increasing the sustainable share in the market (Schabek, 2020).

The results contrast Nizam et al. (2019), who conducted a study on 713 banks in 75 countries and found a positive relationship between return on equity (financial performance) and sustainable performance. Another study also has opposite results and suggests that banks with assets less than USD two billion return on equity positively impact ROE (Nizam et al., 2019).

Net interest is the second determinant used in the current study to measure the profitability in the banking sector. Regression analysis in the current study indicated that NIM significantly impacts banks' sustainable performance in Pakistan based on the findings (OLS-Beta = 0.2116, $P < 0.05$). These findings are consistent with Angori et al. (2019a). They analyzed the determinants of NIM in the Euro area from 2008 to 2014 to measure the sustainable performance of the financial institution and suggest it was difficult for these institutions to maintain sustainable performance in profits, especially during the financial crisis due to the vulnerability of margin in the European banking system. The capitalization, market power, efficiency level, interest risk, and institution and regulatory setting affected the NIM, resulting in declining sustainable performance. The banks are persistently vulnerable to declining sustainable performance due to declining NIM (Angori et al., 2019a). Similarly, Puspitasari et al. (2021) conducted a study on the banking sector of Indonesia and used NIM as a key measure of sustainable performance. The results suggest that NIM indicates profitability for sustainable banks' performance (Puspitasari et al., 2021).

In contrast, Dinçer and Altınay (2022) had the opposite results when they conducted a study on seven banks in Turkey from 2010 to 2020 and compared financial performance with sustainable performance. The study used human resources, community involvement, product liability, and environment for sustainable performance and ROA, NIM, and ROE as criteria for financial performance. The results suggest a significant relationship between

ROA and sustainable performance, whereas no significant impact was found between sustainable performance and NIM (Dinçer & Altınay, 2022).

4.9.3 Impact of Risk Management Capability on Sustainable Performance of Banks

Capital ratio and z-score are used in the current study to examine the risk management capabilities of Pakistani banks. Initially, the researcher tests the overall impact of risk management capabilities on a bank's sustainable performance, as H3 of this study proposed that RMC significantly impacts a bank's sustainable performance. The study evaluated the effects of the RMC through the inclusion of two proxies, i.e., capital ratio (beta= -1.875, $p < 0.00$) and z-score (beta= 0.000308, $p < 0.00$). Findings are coherent with the findings of Bui et al. (2020), who elaborated on the importance of the relationship between risk management capability and sustainable performance.

Pampurini and Quaranta (2018) also have the same results and state that risk management is vital for achieving sustainable performance within financial intermediaries. Risk management and assessment are normal procedural requirements for quantifying and identifying social and environmental risks. In the backdrop of the global financial crisis, Disyatat (2011) results are similar, and analysis suggests that banks' risk management capability can either decrease or increase the impact on the economy or harm the sustainable performance of banks.

Zheng et al. (2019) conducted a similar study to examine the relationship between banks' risk management and internal and external determinants with the sustainable performance of banks in Pakistan. The study found a significant relationship (Zheng et al., 2019). Likewise, Raible (2016) suggests that a balance between profit and risk is needed to safeguard against excessive risk-taking to achieve sustainable performance because of banks' strategy of non-alignment.

Our current study results are similar to Zheng et al. (2021), who suggest Bangladeshi environmental risk management policies significantly impact sustainable performance. Another study also suggests that environmental risk management encourages financial institutions and banks to include environmental and social principles in risk management to achieve sustainable performance (Weber & Chowdury, 2020).

In contrast, Ghosh (2014) states that Z-score is an important indicator of banks' risk management capability. The same results have been found by Boyd et al. (1993), who developed a Z-score and measured statistically the bankruptcy probability for banks and other organizations. The banks with better risk management capabilities having high Z-scores are less prone to bankruptcy (Boyd et al., 1993).

Fang (2021) also had opposite results when analyzing 5221 listed companies of the USA in the sustainable performance information network using a fixed effect panel model and used a z-score as a proxy to determine the relationship between distress (risk management capability) and sustainable performance and found a positive relationship. The results suggest that the companies following sustainable performance practices have better risk management capabilities (Fang, 2021). The results also contrast with Orazalin et al. (2019), who analyzed 45 companies in Russia to investigate the relationship between risk management capability and sustainable performance. The companies enhance sustainable performance indicators to manage risk and ensure financial stability (Orazalin et al., 2019).

The capital ratio is measured as equity to the total assets ratio. The capital ratio is the second determinant used in the current study to measure the RMC in the banking sector. As indicated previously, it influenced the bank's sustainable performance significantly. These findings are consistent with Horváth et al. (2014), who suggest that the capital ratio is an important indicator of the risk management capability of banks. Similarly, Köhler (2015)

suggests that the capital ratio is an important indicator of banks' risk management capability. The results of this research are similar to many researchers who suggest a significant relationship between banks' risk management capability and capital ratio (Mamatzakis et al., 2016; Noor & Ahmad, 2011; Pasiouras, 2008; Rosman et al., 2014; Semih Yildirim & Philippatos, 2007). Capital ratios are vital for sustainable performance and impact banks' risk management capability (Brandao-Marques et al., 2020; Ding & Sickles, 2019). The current research results are also coherent with Abbas, Masood, et al. (2021), who suggest a positive relationship between large commercial banks' risk-taking, sustainable performance, and capital ratios in the United States (Abbas et al., 2021).

In contrast, few scholars advocate that the performance of banks remains good with low capital ratios (Vu & Nahm, 2013; Zhang et al., 2012; Casu & Molyneux, 2003; Sufian & Habibullah, 2009a; Chitan, 2012; Apergis, 2014). Similar results have been suggested by a few researchers who state that low capital ratios contribute more toward banks' profitability than higher capital ratios (Mollah & Zaman, 2015; Curak et al., 2012). Chronopoulos et al. (2015) studied US banks and found a negative relationship between capital ratios and banks' profitability.

Another study has the opposite point of view. Haris et al. (2020) measured the impact of capitalization on financial performance for 29 banks in Pakistan, and the results indicate that profitability only increases to a particular level on the increase in capitalization and after that, an increase in capitalization results in a decrease in profitability, impacting sustainable performance (Haris et al., 2020). Srairi (2013) found no relationship between capital ratio and banks' risk management capability.

4.10 Impact of External Factors on Sustainable Performance of Banks

The present study has another novelty; the researcher utilized some external factors to check their impact on banks' sustainable performance in Pakistan as an external factor. Economic growth, inflation, interest, and exchange rates determine the external factors. Therefore, to address objective 2, hypotheses 4, 5, 6, and 7 of the study were tested. Statistical analysis shows that two external factors, interest rate and inflation, have an insignificant impact on the sustainable performance of banks. In contrast, GDP and exchange rate significantly impact sustainable performance.

Current study findings are associated with the findings of Agade (2014), who suggest a significant relationship between external variables and the operational efficiency of banks, leading to sustainable bank performance. The results of this study are similar to Dedu et al. (2021), who measured external factors' impact on the banking system's sustainable performance and suggested that external factors such as gross domestic impact and inflation impact the sustainable performance of banks. Similar results have been reported by Nadal (2011), who formulated a policy paper on "Macroeconomic Policies, Livelihoods & Sustainability" in Mexico under the ambit of the International Union for Conservation of Nature and Natural Resources (IUCN).

4.10.1 Impact of GDP on Sustainable Performance of Banks

Economic growth is the first factor used as an external factor to check the impact on bank sustainable performance. The study hypothesized that H4 GDP significantly impacts sustainable performance in Pakistani banks, and as indicated in Table 4.11, H4 was accepted. Our current study's results align with Hermes and Nhung (2010), who investigated the DEA determinants in Asia and Latin America between 1991 and 2000. Results of the study indicate that with GDP growth, the economy and sustainable performance accelerate because

GDP growth is the main indicator of the economic situation. Therefore, the banks focus on countries with bigger GDPs for investment purposes. This investment can be ensured by operating more branches, increasing capitalization, or mergers and acquisitions.

Similarly, the findings of a study show that banks operate efficiently where these banks are located in countries with good GDP growth and prospects for development, contributing to sustainable performance (Hermes & Nhung, 2010). These results are also coherent with many studies (Hermes & Nhung, 2010; Zhang et al., 2012; Garza-Garcia, 2012; Vu & Nahm, 2013; Tan & Floros, 2013; Johnes et al., 2014; Hou et al., 2014).

In contrast, a negative impact of GDP on sustainable performance and GDP has been observed by Sufian and Habibullah (2009b) in the Korean banking sector. Some scholars have found similar results (Semih Yildirim & Philippatos, 2007; Moussawi & Obeid, 2011; and Zhang et al., 2012). However, Abu-Alkheil et al. (2012a) advocate that GDP remained irrelevant for efficiency and sustainable efficient performance in their research. According to Tampakoudis (2013), the sustainable performance indicators eleven, and out of these, only seven, including GDP, are statistically significant; however, these are unfavorably related to GDP growth. The GDP does not significantly impact sustainable performance (Fioramonti et al., 2019). Using GDP as the measurement of sustainable economic growth gives the wrong signal to policymakers, especially in countries where negative ones surpass positive effects (Coscieme et al., 2020).

4.10.2 Impact of Inflation on Sustainable Performance of Banks

Inflation is the second factor used in the current study to measure the external factors, and H5 proposed that inflation significantly influences banks' sustainable performance. Hypothesis testing in the current study indicated that inflation has an insignificant impact on banks' sustainable performance. Nevertheless, there are possibly some crucial factors behind

these surprising findings. This study's results align with Grigorian and Manole (2002), who suggest that inflation has no impact on the sustainable performance of banks (Grigorian & Manole, 2002). In contrast, Moussawi and Obeid (2011) utilized inflation as the main variable in the Islamic banks' study to measure sustainable performance. They found a significant and positive relation between inflation and efficiency performance.

While most previous studies found a negative relationship between inflation and sustainable performance, these studies validated that inflation affects the sustainable performance of banks negatively and significantly (Sufian & Habibullah, 2009b; Vu & Nahm, 2013). Similarly, Alimi (2014) examined the relationship between inflation and Nigeria's financial sector performance and suggested that inflation badly impacted the financial sector's sustainable performance. The inflation due to poor economic performance impacted negatively, resulting in poor economic growth and inequality in income. The study suggests that stable prices are mandatory for achieving financial sector development, sustainable financial performance, and economic growth (Alimi, 2014). Ioan et al. (2020) investigated the effect of inflation on sustainable performance and economic growth vis-à-vis GDP in Brazil, Romania, and India from 2005 to 2017 using panel data analysis. Sustainable performance decreased due to inflation throughout the global financial crisis and even after the financial crisis (Ioan et al., 2020).

4.10.3 Impact of Exchange Rate on Sustainable Performance of Banks

The exchange rate is another factor utilized in this research as an external factor. H6 stated that the exchange rate significantly impacts sustainable performance; the findings supported the hypothesis. Therefore, the H6 of the study is accepted.

The current study results are similar to Keshtgar et al. (2020), who analyzed the sustainable performance of 14 Iranian banks and examined the impact of exchange rates on

the financial performance of banks. The financial performance of banks was adversely affected due to the volatile exchange rates. The econometric model used by these researchers reveals that the volatility of exchange rates has a negative and significant impact on the capital return ratios of banks (Keshtgar et al., 2020).

In contrast, Hatmanu et al. (2020) find a positive relationship. These authors analyzed the impact of exchange rates on sustainable economic growth performance in Romania. The results suggest that exchange rates positively influence sustainable performance. The exchange rate is highly significant for Romania's economic growth and sustainable performance (Hatmanu et al., 2020). A similar study was conducted by Thaddeus and Nnneka (2014) on the variable that affects exchange rates, and the researcher advocates that interest rates, exchange rates, and inflation are highly correlated.

The appreciation and depreciation in the interest rates unexpectedly impacted the current account deficit of Australian banks (Karfakis & Kim, 1995). The research shows that the wealth of a nation decreases with an increase in the current account deficit, resulting in the depreciation of local currency and appreciation in the exchange rates. Obstfeld and Rogoff (1995) reported a fall in the real value of the currency.

The two proxies of banks' performance, capital deposit ratio and loan loss to total advances ratio, have been used by Taiwo and Adesola (2013) in a study undertaken on banks' performance in Nigeria to examine the impact of exchange rates on banks' performance. The model of study advocates that the effect of exchange rates on the performance of banks is related to the proxies utilized to assess the performance of banks. Their specified models suggest that the impact of exchange rate on bank performance is sensitive to the type of proxy used to capture bank performance (Taiwo & Adesola, 2013).

4.10.4 Impact of Interest Rate on Sustainable Performance of Banks

Researchers considered the interest rate another external factor and proposed hypothesis H7, that the interest rate significantly influences banks' sustainable performance. Empirical findings of the current study indicated that interest rate has an insignificant impact on banks' sustainable performance in Pakistan. Therefore, H7 is rejected, and the findings were in contrast to those of Chupina et al. (2022), who assessed the relationship between interest rates and the sustainable performance of banks in Russia. The study analyzed the credit market in Russia in the COVID-19 pandemic scenario to assess the sustainable performance of banks. The interest rates were high at the initial stage of the pandemic due to heterogeneity in banks and borrowers. The study results suggest that the management tightened interest rates to achieve sustainable performance goals (Chupina et al., 2022).

Adrian et al. (2019) also suggested that interest rates are an important indicator of sustainable performance for financial stability and monetary conditions. However, the findings of Al-Slehat and Altameemi (2021) supported the results. They suggested that the banks are witnessing a decline in the interest rate due to globalization and liberalization. To achieve sustainable financial performance, banks resort to non-interest income-related activities (Al-Slehat & Altameemi, 2021). In contrast, Hatmanu et al. (2020) suggest that sustainable economic growth performance is negatively related to interest rates.

Hence, prior studies reported mixed evidence of the effect of interest rates on banks' sustainable performance. Rashid and Jabeen (2016) reported a negative effect of interest rate on banks' sustainable performance, while Yahya et al. (2014) stated that interest rate significantly impacts sustainable performance.

4.11 Other Factors and on Sustainable Performance of Banks

This study also inducted some bank-specific factors to examine their effect on bank sustainable performance in Pakistan. Banks' size, loan intensity, financial leverage, and credit risk are included as banks specific factors for this study. Empirical findings through the regression model using OLS, fixed-effect, and random-effect models indicated that some factors significantly influenced bank sustainable performance. In contrast, factors like credit risk and loan intensity have an insignificant effect on bank performance. Previous studies like Orazalin et al. (2019) included size, age, leverage, and financial capacity as control variables significantly impacting sustainable performance and financial performance.

Similarly, many studies advocate that the size of the bank is the main determinant of sustainable performance, efficiency, profitability, and risk management capability. The scholars observed a significant impact on efficiency, profitability, risk management capability, and sustainable performance. Therefore, banks with large sizes are operating efficiently and profitably and have no risk of bankruptcy. On the other hand, few studies advocate that small banks are more efficient than large banks (Ariff & Can, 2008; Hasan & Marton, 2003; Moussawi & Obeid, 2011). Most of the studies were neutral regarding the impact of banks on efficiency (Sufian, 2009; Tan & Floros, 2013; Noor & Ahmad, 2011). In contrast, certain studies concluded that no relationship between efficiency and bank size had been found. (Garza-Garcia, 2012; Wanke & Barros, 2014).

Krishna et al. (2021) state that bank size significantly impacts profitability and sustainable performance. The results and findings of Houston et al. (2010); Bertay et al. (2013); Chronopoulos et al. (2015) are also in line with Krishna et al. (2021). In contrast, David and Alhadeff (1964) found that bank size has a negative impact on the profitability of banks. Few other researchers also support the findings of David and Alhadeff (1964), such

as Haan and Poghosyan (2012) and Petria et al. (2015). In contrast, Quan et al. (2019) suggest that the banks' size has no significant impact on banks' profitability. After achieving some level of profitability, the bank's size experiences a reduction in profitability, whereas the smaller banks start gaining more profitability compared to larger banks (Berger, 1995). Similarly, the banks' size remained irrelevant to profitability (Curak et al., 2012; Tan & Floros, 2013).

According to Tabak et al. (2015), a positive and significant relationship exists between banks' size and risk management capability. Banks with large sizes are more stable than smaller ones (Tabak et al., 2015). Similarly, some studies found a positive relationship between bank size and risk management capability (Nguyen et al., 2012; Srairi, 2013; Cubillas & González, 2014). Alharthi's (2016) results suggest a negative relationship between bank size and Z-score, and the bank size decreased capital ratios for Islamic banks (Alharthi, 2016). The researchers also found a negative relationship between bank size and risk management capability (Tan & Floros, 2013; Dong et al., 2014; Ghosh, 2014; Williams, 2014; Kohler, 2015). Krishna et al., 2021 conducted a study on "determinants of bank profitability: empirical evidence from a small Pacific Island developing state," the study results show that risk and bank size have a positive relationship with the performance of the performance banks.

Most studies suggest that banks' sustainable performance increased by providing more loans. (Semih Yildirim & Philippatos, 2007; and Pasiouras, 2008 ; Sufian & Habibullah, 2009a; Garza-Garcia, 2012; Johnes et al., 2014). Few researchers state that more loan makes a bank more prone to risks (Noor & Ahmad, 2011; Sufian, 2009).

The loan intensity significantly and positively impacts banks' profitability (Sufian & Habibullah, 2009b). A study on Chinese banks concludes that more loans result in higher

profits (Lin & Zhang, 2009). According to Chronopoulos et al. (2015), reduced loans result in more profits. The loans increase risk-taking and decrease the bank's risk management capability (Berger et al., 2009). In contrast, a study reveals that banks with higher loan intensity have high z-scores (Kohler, 2015).

Lee and Chih (2013) examined the efficiency of large and small banks in China from 2004 to 2011. This study claimed that credit risk (loan to deposits ratio) empirically determined the profit efficiency significantly and negatively in smaller banks. The finding suggests that banks must focus on increasing loans to raise efficiency. Hou et al. (2014) found the same relationship between credit risk and efficiency. Ariff and Can (2008) concluded the opposite results, which confirm that engaging in more lending activities led to worse efficiency from 1995 to 2004 in China. These findings align with the study conducted on the Chinese banking sector from 1999 to 2008 (Zhang et al., 2012).

Credit risk influences Pakistani banks' profitability negatively and significantly (Saghir & Ch, 2020). In addition, it was revealed that the fewer the non-performing loans, the lower the risk factor experienced. The financial risk comprising credit and liquidity risk tends to significantly impact the overall enactment of commercial banks in Pakistan (Saghir & Ch, 2020). A significant increase in loans increases return on equity. The loan-to-deposit ratio is negative to return on equity (Chitan, 2012).

The risk-taking behavior and liquidity are vital to calculating the risk management capability of banks, and the banks with stable liquidity are highly risk-taking banks (Abbas et al., 2021). There is a negative correlation between loan-to-deposit ratios and z-scores; the banks are liable to take less risk with an increase in the loan-to-deposit ratio (Lee & Chih, 2013). There is no relationship between the loan-to-deposit ratio and z-score (Dong et al., 2014). A positive relationship exists between credit risk and banks' risk management

capability (Jeon & Lim, 2013). A negative and significant relationship exists between credit risk and banks' risk management capability (Matey, 2021).

Few studies concern financial leverage as a determinant of efficiency (Abu-Alkheil et al., 2012b). This study examined efficiency as a first stage in the UK, Malaysia, GCC, and Turkey from 2005 to 2008. The second stage evaluated the variables that had an impact on efficiency. Abu-Alkheil et al. (2012b) suggested a significant negative relationship between financial leverage and DEA scores.

Abu-Alkheil et al. (2012b) examined the relationship between financial leverage and the profitability of Jordanian banks from 1993 - 2004 and found that financial leverage is a vital determinant of profitability. Financial leverage negatively and significantly impacted banks' profitability (Abu-Alkheil et al., 2012b).

4.12 Chapter Summary

This chapter presents the analysis, results, and discussion of the results. A correlation analysis followed the descriptive analysis. The regression model, including fixed effect, OLS, and random effect, was used in this chapter. The results were compared with the objectives formulated in Chapter 1 and the hypothesis derived in Chapter 2.

In order to address research objective 2, the impact of internal factors (efficiency, profitability, and risk management capability) was observed on sustainable performance. Hypotheses H1, H2, and H3 were tested to fulfil research objective 2. The study's first hypothesis indicates that efficiency positively impacts sustainable performance, and the current study findings confirm this hypothesis. The first hypothesis of this study was accepted, and these results also proved the study's first objective. The efficiency of the banks

was based on the DEA method, and the results showed it significantly impacts the banks' sustainable performance.

The study's second hypothesis indicates that profitability positively impacts sustainable performance, and the current study findings confirm this hypothesis. The second hypothesis of this study was accepted, and these results also proved the study's first objective. Two indicators were used to measure profitability, including NIM and return on equity. Regression analysis in the current study indicated that NIM and ROE significantly impact banks' sustainable performance in Pakistan.

These results provided evidence regarding the relationship between RMC and sustainable performances. It is confirmed that H3 of the study is accepted Z-score used as the first indicator in this research for RMC. Study findings concluded that the z-score significantly influences banks' sustainable performance. The other indicator of RMC was the capital ratio, measured as the equity to total assets ratio. Empirical findings of the current study indicated that capital ratio significantly impacts banks' sustainable performance in Pakistan based on all the models.

The researcher utilized a few external factors to examine their impact on banks' sustainable performance in Pakistan as an external factor to address research objective 2. For this purpose, hypotheses H4, H5, H6, and H7 were tested. GDP, inflation, interest rate, and exchange rate are used to determine the impact of external factors on the sustainable performance of banks. Statistical analysis shows two external factors positively and significantly impact banks' sustainable performance, including GDP and exchange rate. The study hypothesized that H4 GDP significantly impacts sustainable performance in Pakistani banks. Results show that GDP has an impact on sustainable performance. As a result, the H4

has been accepted. Inflation is the second factor used in the current study to measure the external factors, and H5 proposed that inflation significantly influences banks' sustainable performance. Hypothesis testing in the current study indicated that inflation has an insignificant impact on banks' sustainable performance in Pakistan based on all the models. Another external factor incorporated in this study is the exchange rate. Therefore, H6 stated that the exchange rate significantly impacts sustainable performance; findings supported this hypothesis. Researchers considered the interest rate another external factor and proposed hypothesis H7, that the interest rate significantly influences banks' sustainable performance. Empirical findings of the current study indicated that interest has an insignificant impact on banks' sustainable performance in Pakistan based on all the models except the fixed-effect model. Therefore, H7 is not supported by this result.

The other bank-specific factors that examine the effect on bank sustainable performance in Pakistan are loan intensity, bank size, credit risk, and financial leverage. Empirical findings through the regression model using OLS, fixed-effect, and random-effect models indicated that some factors significantly influence bank sustainable performance. In contrast, factors like credit risk and loan intensity have an insignificant effect on bank performance.

The next chapter is the conclusion and recommendations.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Overview

This chapter presents the conclusions and recommendations of the thesis about the problem statement and objective of the research. The chapter starts with a summary of the overall results and findings of the study. The research implications encompassing theoretical implications, practical implications, and social implications are discussed in this chapter. Further, it recognizes the major limitations of the research and devices the most suitable recommendations for future research. Finally, the chapter ends with thoughtful concluding remarks.

5.2 Summary of Results

The present study focussed on measuring the sustainable performance of Pakistani banks to give confidence to investors and customers so that the banks can maximize their efficiency, enhance profitability, and mitigate risk by adopting comprehensive risk management capabilities. For this reason, three key research objectives were formulated (one general objective and two specific objectives). To investigate the sustainable performance of banks in Pakistan, 2) To assess the impact of internal factors (efficiency, profitability, and risk management capability) on the sustainable performance of banks in Pakistan, 3) To analyze the impact of external factors (GDP, inflation, interest rate, and exchange rate) on the sustainable performance of banks in Pakistan. When the literature was reviewed, seven hypotheses were formulated, highlighting the impact on sustainable performance as shown in the research framework of Chapter 2. The sustainable performance of banks is a vast subject and cannot be confined to one odd variable. Sustainable performance becomes weak

due to different contributing factors, such as inefficiency in the banking sector, less profitability, and the risk of being unstable due to insolvency and bankruptcy issues. Sustainable banks can accelerate efficiency, increase profitability and decrease insolvency risk, as these contribute to image building and attracting customers, lowering the reputational risk and contributing to economic growth.

Due to sustainable performance practices in the banking sector, economies of developed countries like the USA, Japan, China, and Europe are growing, and the banking sector focuses on efficiency, profitability, and risk management in banking sectors. Best practices are needed for developing countries, especially in the Pakistani banking sector. All the private Pakistani banks were nationalized in 1974 due to political issues contributing negatively to sustainable banking in Pakistan. With the new reforms of 1991, the privatization status of banks was restored, and banking sector performance is moving in a positive direction, contributing positively to sustainable banking in Pakistan. Sustainable performance in banks is challenging due to internal factors like efficiency, risk management, and efficiency. These internal and external factors also contribute significantly toward the sustainable performance of banks.

The country's economy may shrink in the absence of sustainable bank performance. Similarly, by incorporating important variables like efficiency, profitability, and risk management capability with corresponding external factors like GDP, inflation, interest rate, and exchange rate, overall sustainable performance results for the banking sector of Pakistan have been recorded. The banking sector growth will be at stake without these variables. Therefore, the banks may become prone to insolvency and bankruptcy without efficiency and profitability. In the absence of sustainable performance in the banking sector, the

economy of Pakistan may shrink as banks have a leading role in the economic growth of Pakistan. Therefore, the overall sustainable performance of the banking sector cannot be confined to only one odd variable. The banking sector performance is an integration of findings of different factors of the wide range of variables chosen from the discipline of Finance, Accounting, and Economics that contribute to measuring the sustainable performance of the banking sector. The sustainable performance of banks is an important issue discussed in developed economies by researchers worldwide. However, the subject is rarely researched in developing countries like Pakistan. The abovementioned was the main reason for targeting the banking sector of Pakistan, with the main focus on banking efficiency, profitability, and risk management capability.

The Pakistani banking sector's sustainable performance can be increased by implementing the conceptual framework created in this study. This framework will be introduced for the first time in Pakistan to measure and enhance the sustainable performance of banks in Pakistan. A unison study has been conducted to combine the impact of efficiency, profitability, and risk management capability with corresponding internal and external factors on the sustainable performance of banks. The government and senior management of Pakistani banks can take safeguards in light of the results of recommendations for measuring the sustainable performance of banks to enhance profitability, efficiency, and risk management capability, as this research aims to empirically investigate the impact of efficiency, profitability, risk management capability, and external factors such as GDP, inflation rate, interest rate and exchange rate on the sustainable performance of banks in Pakistan. This research achieved the research objectives as specified above.

5.3 Relation of Results with Research Objectives

This research aims to empirically investigate the impact of internal and external factors on the sustainable performance of banks in Pakistan. This research achieved three research objectives (one general and two specific), as specified in the first chapter. These objectives are as follows:

5.3.1 General Objective

- i. To develop a framework for the investigation of banks' sustainable performance in Pakistan from the internal and external perspectives.

5.3.2 Specific Objectives

- i. To assess the impact of internal factors (efficiency, profitability, and risk management capability) on the sustainable performance of banks in Pakistan;
- ii. To analyze the impact of external factors (GDP, inflation, interest rate, and exchange rate) on the sustainable performance of banks in Pakistan.

A functionalist paradigm approach was adopted to find the answer to the problems identified in the problem statement and achieve the identified objectives. This approach extends an opportunity to formulate a conceptual framework and achieve objectives by deriving a set of seven hypotheses. The current research started with a comprehensive literature review to comprehend the research domain. After reviewing the literature, the research gap was identified, and a conceptual model was developed. This step was followed by hypothesis development and testing. Data was used to test the model and examine hypotheses. The data type was identified as quantitative by establishing an epistemological stance. The present thesis used a quantitative research approach for the collection of data.

The quantitative methodology was based on secondary data as a collection of data. The study's research objectives have been achieved using secondary data.

The current research aimed not to develop a theory but to test an existing theory and hypotheses built on existing literature. The empirical data was collected, and hypotheses were tested by analyzing the data to verify the validity and reliability of the framework. The researcher collected time series data for the respective banks between 2016 and 2020 since the banking sustainable performance and organizational sustainable performance directive was introduced in the country in 2016. Therefore, data between 2016-2020 was collected.

This research has developed seven main hypotheses. These hypotheses were tested by collecting data through a survey, and a statistical package of E-VIEWS-V9 was employed to conclude the results. The current thesis tested the relationship between the sustainable performance of banks and the internal and external factors within the context of Pakistani banks. Hypotheses H1, H2 and H3 were tested to address the first research objective, while hypotheses H4, H5, H6 and H7 were considered for the second research objective.

The impact of efficiency was assessed on the Pakistani banks' sustainable performance by reviewing the existing relational literature on sustainable performance, efficiency, technical efficiency, pure technical efficiency, and scale efficiency given in Chapter 2 and by describing the quantitative research survey results presented in Chapter 4. These results provided evidence regarding the relationship between sustainable performance and efficiency. These results supported the first hypothesis.

The study's first hypothesis indicates that efficiency significantly impacts sustainable performance, and the current study findings confirm this hypothesis. The first hypothesis of this study was accepted. This result also confirms the first objective of the study.

The second hypothesis for the study states that significant association between profitability and sustainable performance of the banks. The impact of profitability on the Pakistani banks' sustainable performance was examined and a significant relationship has been found. These results provided evidence regarding the relationship between sustainable performance and profitability. This result supported the second hypothesis of the study.

Profitability in the current study was measured as return on equity and NIM. However, hypothesis 2 of this study proposed that overall profitability significantly impacts banks' sustainable performance, which is confirmed through statistical findings based on ordinary least squares. This result supported the second hypothesis of the study. This result also confirms the first objective of the study.

The impact of risk management capability was analyzed on the Pakistani banks' sustainable performance by reviewing the existing relational literature on sustainable performance, z-score, and capital ratio in Chapter 2 and by describing the quantitative secondary research results presented in Chapter 4. These results supported the relationship between sustainable performances and risk management capability. The results confirmed the first objective and hypothesis three. Capital ratio and z-score were used in the current study to examine the risk management capabilities of banks in Pakistan. The researcher tested the overall impact of risk management capabilities on the sustainable performance of banks as H3 of this study proposed that RMC significantly impacts banks' sustainable performance. It is confirmed through statistical findings based on ordinary least squares, fixed effect, and random effect models. In conclusion, it is confirmed that H3 of the study is accepted, and objective number two, mentioned in Chapter 1

The present study has another innovation; the researcher utilized a few external factors to ascertain their impact on the sustainable performance of banks in Pakistan. GDP,

inflation, interest rate, and exchange rate are the external factors associated with objective 2 of the study. Therefore, hypothesis 4 of the study proposed that one of the external factors, i.e., GDP, significantly impacts banks' sustainable performance. Statistical analysis shows that GDP positively and significantly impacts banks' sustainable performance. Consequently, hypothesis 4 of the study is supported by this result and confirms objective 2, as proposed in Chapter 1.

GDP is the first factor used as an external factor to check the impact on bank sustainable performance. The study hypothesized that GDP significantly impacts the sustainable performance of banks in Pakistan. Results show that GDP has an impact on sustainable performance. As a result, the H4 has been accepted.

Inflation is the second factor used in the current study as the external factor, and H5 proposed that inflation significantly influences banks' sustainable performance. Hypothesis testing in the current study indicated that inflation has an insignificant impact on the sustainable performance of banks in Pakistan based on all the models. Nevertheless, there are possibly some crucial factors behind these surprising findings.

The exchange rate is another factor utilized in this research as an external factor. H6 stated that the exchange rate has a significant impact on sustainable performance. The results of this study also supported this hypothesis.

Researchers considered the interest rate another external factor and proposed hypothesis H7, that the interest rate significantly influences banks' sustainable performance. Empirical findings of the current study indicated that interest has an insignificant impact on the sustainable performance of banks in Pakistan based on all the models except the fixed-effect model. Therefore, H7 is not supported by the study's results.

The impact of control variables was also analyzed within the context of the sustainable performance of the Pakistani banks by reviewing the existing relational literature on the topic of sustainable performance, bank size, loan intensity, financial leverage, and credit risk given in Chapter 2 and by describing the quantitative research survey results presented in Chapter 4. These results supported the relationship between sustainable performances and these control variables.

The bank-specific control variables that examine the effect on the sustainable performance of banks in Pakistan are loan intensity, bank size, credit risk, and financial leverage. Empirical findings through regression model using OLS, fixed-effect model, and random effect model indicated that some of these factors significantly influence the sustainable performance of banks. In contrast, some factors like credit risk and loan intensity have an insignificant effect on the sustainable performance of banks.

5.4 Research Implications

This research contributes to the body of knowledge in many domains and will assist in constructing future research models and objectives in Pakistan and other countries. The main implications of this research in theory and practice are discussed in the following sections. This research was designed to address the current issue of the sustainable performance of banks in general and particularly in Pakistan. The impact of banks' internal and external factors has been studied to measure their impact on the sustainable performance of banks. This research will have the following implications:

5.4.1 Theoretical Implications

The present research holds numerous implications, both theoretically and practically. With the increasing focus on sustainable performance and environmental concerns, many

corporate sectors in Pakistan are paying a great focus on incorporating policies that can lead to sustainable performance. However, the existing literature highlighted a need for more work on the sustainable performance of banks. The present study extends the literature and investigates the sustainable performance of banks through unique external and internal factors. Furthermore, the present study also extends the environmental, social, and governance models. Banks are shifting their practices towards green initiatives; they now emphasize that they are also meeting strict standards regarding climate risk reporting. By incorporating the ESG model, the present research extends the growing body of literature regarding variables under study and the relationship between variables that have not been studied before. Therefore, the present research holds numerous theoretical implications. This research is of the first kind in the banking sector literature by incorporating the impact of all important subjects, such as efficiency, profitability, risk management capability, GDP, inflation, exchange rate, and interest rate, as internal and external factors in one study. Banks performance framework (BPF) will add to the knowledge of banking sector literature, especially in Pakistan. The complete picture of banks' sustainable performance, ranging from the impact of banks' internal factors (efficiency, profitability, risk management) and external factors (GDP, inflation, interest rate and exchange rate), will assist the management of banks in enhancing efficiency and profitability and avoiding bankruptcy.

Sustainable studies related to the banking sector are limited in the finance literature, and these should be addressed in banking sector studies, especially in developing countries. This study encompasses the financial, accounting, and economic variables that theoretically contribute to the banking sector and finance studies. Most researchers have predicted that future finance and banking sector studies will be innovative and interdisciplinary because a holistic outcome is impossible under one discipline, especially in the banking sector. This

study will lay the foundation for the researchers to conduct more sustainable performance studies in the finance and banking sectors.

Most former studies focused on measuring efficiency, profitability, and risk management capability separately and independently. The methodology of combining these important subjects in one conceptual framework remained ignored in the methodology of the banking sector framework. This study incorporates three conceptual frames for variable efficiency, profitability, and risk management capability. These three variables will be measured, and then the impact of these variables will be calculated on the sustainable performance of banks. The ESG model has also been used to determine the sustainable performance of Pakistani banks.

5.4.2 Practical Implications

Innovative studies related to Pakistani banking sectors are scarce. Banks face looming threats from the financial action task force (FATF), inefficiency, various risks, and low profitability. This holistic study is the first one to focus on efficiency, profitability, and risk management capability in one study. This research benefits policymakers, management, and investors of Pakistan to assess the sustainable performance of banks in Pakistan, and the same performance variables can be utilized by banking sector management in other countries. A complete picture of banks, ranging from banks' efficiency, profitability, and risk management, including banks' specific internal and external factors, will assist the management of banks in enhancing efficiency, maximizing profitability, and avoiding bankruptcy.

Pakistan is an underdeveloped nation; therefore, its banking sector must catch up to other developed nations' banking sectors. Through this study, the management of Pakistani banks can also gain beneficial insights regarding improved sustainable performance by

incorporating beneficial external and internal factors. By incorporating the ESG model approaches, the sustainable performance of banks can be enhanced, which is also a major practical implication of this research. Sustainable performance in the banking sector equally matters when the management formulates their decision corresponding to the key issues of the bank's operations. The present study is also helpful in assessing sustainable performance because the sustainable performance of banks includes strategies and creating systems and procedures that ensure a stabilized balance between the bank's existing profitability and persistent profit and viability over a longer period. The results of sustainable performance add to the study's practical implications by assessing the internal and external factors of banks that impact and strengthen the sustainable performance of Pakistani Banks.

5.4.3 Social Implications

This research study will assist the banking sector's management in measuring banks' sustainable performance. The management can focus on grey areas and enhance the sustainable performance of banks. The banks are the backbone of a country's economy, and through sustainable performance, these banks will pave the way for overall sustainable growth in a country's economy. The investors' and customers' confidence will enhance the banking sector due to the sustainable performance of banks. This study will be helpful to the investors in making investment decisions for investment in different banks. The sustainable banking sectors will also boost other sectors of Pakistan, like education, health, industry, construction, and tourism, resulting in society's overall well-being.

5.5 Limitations of Study

The data collection and information seeking in the domain of social research depends on the cooperation of individuals and organizations to provide adequate, reliable, and

accurate information. Despite vigorous and thorough work by the researcher, there is always room for improvement, and studies, especially in finance and economics, need more support in the world and Pakistan. The current study provided promising results; nonetheless, the following are the limitations that provide food for thought for future research.

Studies of the sustainable performance of banks have gained focus in developed countries, and studies still need to be conducted in developing countries. Therefore, the focus of this study remained on the Pakistani banking sectors, which are the developing and emerging economies. However, all the variables analyzed in this research study have yet to be researched in a unison study of developed countries. Only 32 banks are listed in Pakistan, and data on all these banks have been used. The data used in this study is limited to banks of one country, and the study's results remained focused on the Pakistani banking sector. The data of other countries have yet to be tested using these variables. These variables have yet to be tested in other developing and developed countries. Data from more than one country have yet to be tested. Similarly, a specific period has been selected in this study. The study has not been tested in different time frames.

The quantitative method was used in this research. The secondary data was collected from the Pakistani banks' annual reports. This research study has not consulted the management of banks, customers, and shareholders. These stakeholders have not been questioned or interviewed in the process of analysis. Therefore, results, analysis, and findings are limited to secondary data analysis, and qualitative methodology has not been adopted in this research study. This research has not tested the mixed methodology encompassing qualitative and quantitative methods. Another methodological limitation is that the researcher used a simple regression model through fixed effect, OLS, and the random

effect. At the same time, this study could not use other latest techniques like RDL or VAR model.

The sustainable performance of banks was assessed through efficiency, profitability, and risk management capability. Artificial intelligence is considered an important component of sustainable banking. The variable of artificial intelligence has not been tested in this study due to time constraints, which would have made the results and findings more fruitful. Similarly, the impact of external factors on sustainable performance has been examined, and only factors of GDP, inflation, exchange rates, and interest rates have been tested. This study has yet to test other external factors, such as the global financial crisis, FATF, and corruption, due to time constraints and the non-availability of data.

Moreover, the impact of control variables has been analyzed on the sustainable performance of banks. For this purpose, only bank size, financial leverage, credit risk, and loan intensity have been assessed. Other control variables, such as ownership and age of the bank, have not been incorporated.

5.6 Recommendations for Future Research

Although, under the guidance of the State Bank of Pakistan, all banks are moving toward digitization, the massive database is unavailable in Pakistan. The future researcher can increase the database and analyze data from 10 to 20 years in Pakistan. The future researcher can expand the scope of research by conducting studies of the banking sector on various continents or regions. Similarly, comparative studies of developed countries (like the banking sector of the USA or Europe) with developing countries may be conducted to measure the sustainable performance of banks and get practical findings and results.

Only secondary data was used in this research by adopting a quantitative methodology. Future researchers may resort to interviews with banking sector experts and other stakeholders to compare the results of secondary data. Similarly, the research may formulate a questionnaire for the banking sector experts, management, and customers to gather the opinions of the different segments on efficiency, profitability, risk amendment capability, external factors, and internal factors. Therefore, the future researcher may adopt a mixed methodology to attain better results from this study.

The future researcher may expand the database and sample. They can use the latest techniques instead of simple regression through OLS, fixed effect, and random effect. These latest techniques will help get practical results by conducting data analysis and interpretation. Techniques like the RDL or VAR model will give better results. Through these latest techniques, the researcher will see the variables' short-term and long-term impact on sustainable performance.

Future researchers can expand the research by incorporating more variables other than efficiency, profitability, risk management capability, and external and internal factors. Artificial intelligence will play a dominant role in any organization's future sustainable performance. Therefore, artificial intelligence is recommended as another variable for future research. Pakistan has been placed on the grey list of FATF. Corruption is another external factor for fraud, fake accounts, and money laundering. The global financial crisis and pandemics like COVID-19 are also external factors that may impact the sustainable performance of banks. Hence, in addition to external factors of GDP, inflation, exchange rate, and interest rate, future research may assess the impact of FATF, corruption, global financial crisis, and COVID-19 or other pandemics on the sustainable performance of banks.

The older bank may be more or less sustainable compared with newly introduced banks, so the age of the bank is also an important internal factor. Ownership is also an important internal factor; foreign, state-owned, and private commercial banks operating in Pakistan. Ownership policy and strategic orientation may impact the sustainable performance of banks. Future research may analyze the impact of banks' age and ownership on banks' sustainable performance.

5.7 Conclusion

This study was designed to achieve three objectives, as given in Chapter 1. Results of the study provided evidence of the significant relationship between efficiency and sustainable performance, profitability and sustainable performance, risk management capability and sustainable performance. Two external factors (GDP and exchange rate) have significant impact on sustainable performance of banks. In contrast inflation and interest rates have no impact on sustainable performance of banks. The sustainable performance of banks can be achieved by enhancing efficiency, maximizing profitability, and increasing risk management capability. Efficiently managing GDP growth and balancing exchange rates will attain sustainable performance of banks in Pakistan. Carefully managing the impacts of banks' size, financial leverage, credit risk, and loan intensity will accomplish the sustainable performance of banks in Pakistan.

This research has novelty and presents the impact of internal factors (efficiency, profitability, and risk management capability), external factors (GDP, inflation, exchange rates, and interest rates), and control variable (banks' size, financial leverage, credit risk, and loan intensity) on the sustainable performance of banks in one unison and holistic study. Whereas these variables have been tested individually in different studies, combined effects

of these variables in one study have been done for the first time in Pakistan. This is ground-breaking work in the literature on the Pakistani banking sector. This thesis contributes to the literature on finance and economics, particularly the banking sector. This study provides a new dimension for future researchers to replicate this study in other countries and regions. Comparative studies can also be conducted between regions. The latest techniques can add new variables to achieve more holistic results.

REFERENCES

- Abbas, F., Ali, S., Yousaf, I., & Wong, W.-K. (2021). Dynamics of funding liquidity and risk-taking: Evidence from commercial banks. *Journal of Risk and Financial Management*, 14(6), 281.
- Abbas, F., Masood, O., Ali, S., & Rizwan, S. (2021). How do capital ratios affect bank risk-taking: New evidence from the United States. *Sage Open*, 11(1), 2158244020979678.
- Abdul-Majid, M., Saal, D. S., & Battisti, G. (2011). Efficiency and total factor productivity change of Malaysian commercial banks. *The Service Industries Journal*, 31(13), 2117-2143.
- Abu-Alkheil, A. M., Burghof, H.-P., & Khan, W. A. (2012a). Comparison of efficiency and productivity changes of islamic and conventional banks: Evidence from europe and Muslim-majority countries? *Journal of Applied Business Research (JABR)*, 28(6), 1385-1412.
- Abu-Alkheil, A. M., Burghof, H.-p., & Khan, W. A. (2012b). Islamic commercial banking in Europe: A cross-country and inter-bank analysis of efficiency performance. *International Business & Economics Research Journal (IBER)*, 11(6), 647-676.
- Adrian, T., Boyarchenko, N., & Giannone, D. (2019). Vulnerable growth. *American Economic Review*, 109(4), 1263-1289.
- Agade, R. (2014). *The effect of macroeconomic variables on operational efficiency of banking sector in kenya* (Master degree thesis University of Nairobi). University of Nairobi Digital Repository, <http://erepository.uonbi.ac.ke/handle/11295/76795>.

- Aish, A.-M., & Jöreskog, K. G. (1990). A panel model for political efficacy and responsiveness: An application of LISREL 7 with weighted least squares. *Quality and Quantity*, 24(4), 405-426.
- Ait Sidhoum, A., Dakpo, K. H., & Latruffe, L. (2022). Trade-offs between economic, environmental and social sustainability on farms using a latent class frontier efficiency model: Evidence for Spanish crop farms. *PloS One*, 17(1), e0261190.
- Akhtar, M. F., Ali, K., & Sadaqat, S. (2011). Factors influencing the profitability of Islamic banks of Pakistan. *International Research Journal of Finance and Economics*, 66(66), 1-8.
- Akomea-Frimpong, I., Adeabah, D., Ofosu, D., & Tenakwah, E. J. (2022). A review of studies on green finance of banks, research gaps and future directions. *Journal of Sustainable Finance & Investment*, 12(4), 1241-1264.
- Al-Homaidi, E. A., Tabash, M. I., Farhan, N. H., & Almaqtari, F. A. (2018). Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics & Finance*, 6(1), 1548072.
- Al-Slehat, Z. A. F., & Altameemi, A. F. (2021). The relationship between non-interest revenue and sustainable growth rate: A case study of commercial banks in Jordan. *The Journal of Asian Finance, Economics and Business*, 8(5), 99-108.
- Alam, M. S., Rabbani, M. R., Tausif, M. R., & Abey, J. (2021). Banks' Performance and Economic Growth in India: A Panel Cointegration Analysis. *Economies*, 9(1).
- Alber, N., Elmofty, M., Kishk, I., & Sami, R. (2019). Banking efficiency: concepts, drivers, measures, literature and conceptual model. *Social Science Research Network*, 1-24

- Aldowaish, A., Kokuryo, J., Almazyad, O., & Goi, H. C. (2022). Environmental, Social, and Governance Integration into the Business Model: Literature Review and Research Agenda. *Sustainability*, 14(5), 2959.
- Alem, H. (2021). The role of technical efficiency achieving sustainable development: A dynamic analysis of Norwegian dairy farms. *Sustainability*, 13(4), 1841.
- Alharthi, M. (2016). *The Determinants of efficiency, profitability and stability in the banking sector: A comparative study of islamic, conventional and socially responsible banks*. (Doctral Dissertation, University of Plymouth). University of Plymouth Research Thesis, <https://dx.doi.org/10.24382/3470>.
- Ali, M. H., Zailani, S., Iranmanesh, M., & Foroughi, B. (2019). Impacts of environmental factors on waste, energy, and resource management and sustainable performance. *Sustainability*, 11(8), 2443.
- Ali, R. (2012). *Financial sector performance and economic growth in Pakistan* (Doctoral thesis, Gomal University DI Khan). Pakistan Research Repository Higher Education Commission Islamabad <http://pr.hec.gov.pk/jspui/handle/123456789//2151>.
- Alim, W., Ali, A., & Metla, M. R. (2021). The effect of liquidity risk management on financial performance of commercial banks in Pakistan. *Journal of Applied Economics and Business*, 9(4), 109 -128.
- Alimi, S. R. (2014). Inflation and financial sector performance: The case of Nigeria. *Timisoara Journal of Economics and Business*, 7(1), 55-69.
- Almeida, F., Faria, D., & Queirós, A. (2017). Strengths and limitations of qualitative and quantitative research methods. *European journal of education studies*. 9(3), 369-387.

- Alshehhi, A., Nobanee, H., & Khare, N. (2018). The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. *Sustainability*, 10(2), 494.
- Anakpo, G., & Oyenubi, A. (2022). Technological innovation and economic growth in Southern Africa: application of panel dynamic OLS regression. *Development Southern Africa*, 39(4), 543-557.
- Andrieș, & Căpraru. (2012). Competition and efficiency in EU27 banking systems. *Baltic Journal of Economics*, 12(1), 41–60.
- Angori, G., Aristei, D., & Gallo, M. (2019a). Determinants of banks' net interest margin: Evidence from the Euro area during the crisis and post-crisis period. *Sustainability*, 11(14), 3785.
- Angori, G., Aristei, D., & Gallo, M. (2019b). Lending technologies, banking relationships, and firms' access to credit in Italy: the role of firm size. *Applied Economics*, 51(58), 6139-6170.
- Apergis, N. (2014). The long-term role of non-traditional banking in profitability and risk profiles: Evidence from a panel of US banking institutions. *Journal of International Money and Finance*, 45, 61-73.
- Aramburu, I. A., & Pescador, I. G. (2019). The effects of corporate social responsibility on customer loyalty: The mediating effect of reputation in cooperative banks versus commercial banks in the Basque country. *Journal of Business Ethics*, 154, 701-719.
- Aras, G., Tezcan, N., & Furtuna, O. K. (2018). Multidimensional comprehensive corporate sustainability performance evaluation model: Evidence from an emerging market banking sector. *Journal of Cleaner Production*, 185, 600-609.

- Ariff, M., & Can., L. (2008). Cost and profit efficiency of Chinese banks: A non-parametric analysis. *China Economic Review*, 19(2), 260-273.
- Avkiran, N.K. (1999). The evidence on efficiency gains: The role of mergers and the benefits to the public. *Journal of Banking & Finance*, 23, 991-1013.
- Bai, H., Irfan, M., & Hao, Y. (2022). How does industrial transfer affect environmental quality? Evidence from China. *Journal of Asian Economics*, 82, 101530. <https://doi.org/https://doi.org/10.1016/j.asieco.2022.101530>
- Bailey, N., Holly, S., & Pesaran, M. H. (2016). A two-stage approach to spatio-temporal analysis with strong and weak cross-sectional dependence. *Journal of Applied Econometrics*, 31(1), 249-280.
- Baltagi, B. H., & Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4). Springer: Wiley.
- Bank, H. (2021). *Habib Bank Limited About Us*. <https://www.hbl.com/about-us>
- Bătae, O. M., Dragomir, V. D., & Feleagă, L. (2020). Environmental, social, governance (ESG), and financial performance of European banks. *Accounting and Management Information Systems*, 19(3), 480-501.
- Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of financial Intermediation*, 22(2), 218-244.
- Bedenik, N. O. (2018). Business between profitability and sustainability. *IDEAS Working Paper Series from RePEc*, 2, 10-22.
- Berger, A. N. (1995). The profit-structure relationship in banking--tests of market-power and efficient-structure hypotheses. *Journal of Money, Credit and Banking*, 27(2), 404-431.

- Berger, A. N. (2009). Comments on bank market structure, competition, and SME financing relationships in European regions by Mercieca, Schaeck, and Wolfe. *Journal of Financial Services Research*, 36, 157-159.
- Berger, A. N., & Humphrey, D. B. (1997). Efficiency of financial institutions: International survey and directions for future research. *European Journal of Operational Research*, 98(2), 175-212.
- Bertay, A. C., Demirgüç-Kunt, A., & Huizinga, H. (2013). Do we need big banks? Evidence on performance, strategy and market discipline. *Journal of Financial Intermediation*, 22(4), 532-558.
- Bessis, J. (2011). *Risk management in banking*. John Wiley & Sons.
- Betts, S. C. (2011). Contingency Theory: science or technology? *Journal of Business & Economics Research (JBER)*, 1(8), 123-130.
- Beurden, V. P., Gossling, T. (2008). The Worth of Values – A Literature Review on the Relation Between Corporate Social and Financial Performance. *Journal of Business Ethics*, 82(2), 407–424
- Bolboaca, S.-D., & Jäntschi, L. (2006). Pearson versus Spearman, Kendall's tau correlation analysis on structure-activity relationships of biologic active compounds. *Leonardo Journal of Sciences*, 5(9), 179-200.
- Bornhorst, F., & Baum, C.F. (2006). *LEVINLIN: Stata module to perform Levin-Lin-Chu panel unit root test*. Boston College, Statistical Software. https://www.academia.edu/29507531/LEVINLIN_Stata_module_to_perform_Levin_Lin_Ch_panel_unit_root_test.

- Boubakri, N., Chen, R., Guedhami, O., & Li, X. (2019). The stock liquidity of banks: A comparison between Islamic and conventional banks in emerging economies. *Emerging Markets Review*, 39, 210-224.
- Boyd, J. H., Graham, S. L., & Hewitt, R. S. (1993). Bank holding company mergers with nonbank financial firms: Effects on the risk of failure. *Journal of Banking & Finance*, 17(1), 43-63.
- Boyd, J. H., & Runkle, D. E. (1993). Size and performance of banking firms: Testing the predictions of theory. *Journal of Monetary Economics*, 31(1), 47-67.
- Brandao-Marques, L., Correa, R., & Saprizza, H. (2020). Government support, regulation, and risk taking in the banking sector. *Journal of Banking & Finance*, 112, 105284.
- Brooks, C., & Schopohl, L. (2018). Topics and trends in finance research: What is published, who publishes it and what gets cited? *The British Accounting Review*, 50(6), 615-637.
- Brundtland, G. H. (1987). Our common future—Call for action. *Environmental Conservation*, 14(4), 291-294.
- Bryman, A. (2008). Why do researchers integrate/combine/mesh/blend/mix/merge/fuse quantitative and qualitative research. *Advances in Mixed Methods Research*, 21(8), 87-100.
- Bubble, S. (2023). *ESG in Banking*. <https://www.sketchbubble.com/en/presentation-esg-in-banking.html>
- Bui, T. D., Ali, M. H., Tsai, F. M., Iranmanesh, M., Tseng, M.-L., & Lim, M. K. (2020). Challenges and trends in sustainable corporate finance: A bibliometric systematic review. *Journal of Risk and Financial Management*, 13(11), 264.

- Bukhari, S. A. A., Hashim, F., & Amran, A. (2020). The journey of Pakistan's banking industry towards green banking adoption. *South Asian Journal of Business and Management Cases*, 9(2), 208-218.
- Bukhtiarova, A., Semenog, A., Razinkova, M., Nebaba, N., & Haber, J. A. (2020). Assessment of financial monitoring efficiency in the banking system of Ukraine. *Banks and Bank Systems*, 15(1), 98-106.
- Bussoli, C., Conte, D., Letorri, G., & Barone, M. (2019). Does it pay to be sustainable? Evidence from European banks. *Int. J. Bus. Manag*, 14, 128-146.
- Buteikis, A. (2018). 06 *Multivariate models: Granger causality, VAR and VECM models*. Andrius Buteikis, andrius.buteikis@mif.vu.lt. http://web.vu.lt/mif/a.buteikis/wp-content/uploads/2018/04/Lecture_07.pdf
- Camba Jr, A. C., & Camba, A. L. (2021). An engle-granger and Johansen cointegration approach in testing the validity of Fisher hypothesis in the Philippines. *The Journal of Asian Finance, Economics and Business*, 8(12), 31-38.
- Casu, B., & Molyneux, P. (2003). A comparative study of efficiency in European banking. *Applied Economics*, 35(17), 1865-1876.
- Chan, N. H. (2001). Time Series: Co-integration. In N. J. Smelser & P. B. Baltes (Eds.), *International Encyclopedia of the Social & Behavioral Sciences*, 15709-15714. Pergamon. <https://doi.org/https://doi.org/10.1016/B0-08-043076-7/00525-8>
- Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal Of Operational Research*, 2(6), 429-444.
- Chee-Yin, Y., & Hock-Eam, L. (2014, December). The opportune time to invest in residential properties-Engle-Granger cointegration test and Granger causality test

- approach. In *AIP Conference Proceedings* (Vol. 1635, No. 1, pp. 948-955). American Institute of Physics. <https://doi.org/10.1063/1.4903696>
- Chen, Q., Goldstein, I., Huang, Z., & Vashishtha, R. (2022). Bank transparency and deposit flows. *Journal of Financial Economics*, 146(2), 475-501.
- Chitan, G. (2012). Corporate governance and bank performance in the Romanian banking sector. *Procedia Economics and Finance*, 3, 549-554.
- Chowdhury, M. A. F., & Rasid, M. E. S. M. (2016). Determinants of performance of Islamic banks in GCC countries: Dynamic GMM approach. *Advances in Islamic Finance, Marketing, and Management, Emerald Group Publishing Limited, Bilgley*, 49-80.
- Chronopoulos, D. K., Liu, H., McMillan, F. J., & Wilson, J. O. (2015). The dynamics of US bank profitability. *The European Journal of Finance*, 21(5), 426-443.
- Chupina, Z., Abanina, I., Abramov, V., Artamonova, K., Yurchenko, O., Osipova, I., & Stroeve, P. (2022). Management of monetary policy in the framework of decision making on setting interest rates for sustainable social system: Example of the Russian Federation. *Sustainability*, 14(1), 79.
- Churchill, G. A., Brown, T. J., & Suter, T. A. (1996). *Basic Marketing Research*. Dryden Press Fort Worth.
- Ciliberti, F., De Haan, J., De Groot, G., & Pontrandolfo, P. (2011). CSR codes and the principal-agent problem in supply chains: four case studies. *Journal of Cleaner Production*, 19(8), 885-894.
- Citterio, A., & King, T. (2023). The role of environmental, social, and governance (ESG) in predicting bank financial distress. *Finance Research Letters*, 51, 103411.
- Collis, J., Hussey, J., Hussey, R., & Hussey, R. (2021). Business research: A practical guide for students (Fifth). In: Red Globe Press.

- Cooper, D. R. & Schindler, P. S. (2006) *Business Research Methods*, 6thn edition, London: McGraw-Hill.
- Coscieme, L., Mortensen, L. F., Anderson, S., Ward, J., Donohue, I., & Sutton, P. C. (2020). Going beyond gross domestic product as an indicator to bring coherence to the sustainable development goals. *Journal of Cleaner Production*, 248, 119232.
- Cubillas, E., & González, F. (2014). Financial liberalization and bank risk-taking: International evidence. *Journal of Financial stability*, 11, 32-48.
- Curak, M., Poposki, K., & Pepur, S. (2012). Profitability determinants of the Macedonian banking sector in changing environment. *Procedia-Social and Behavioral Sciences*, 44, 406-416.
- Cvilikas, A., & Jurkonyte-Dumbliauskiene, E. (2016). Assessment of risk management economic efficiency applying economic logistic theory. *Transformations in Business & Economics*, 15(3/39), 207-219.
- David, & Alhadeff, C. (1964). Growth of large banks, 1930-1960. *The Review of Economics and Statistics*, 46, 356-363.
- Davies, I. A., & Crane, A. (2010). Corporate social responsibility in small-and medium-size enterprises: investigating employee engagement in fair trade companies. *Business Ethics: A European Review*, 19(2), 126-139.
- Davies, M. (2011). Concept mapping, mind mapping, and argument mapping: what are the differences and do they matter? *Higher Education*, 62, 279-301.
- de Abreu, E. S., Kimura, H., & Sobreiro, V. A. (2019). What is going on with studies on banking efficiency? *Research in International Business and Finance*, 47, 195-219.

- De Haan, J., & Poghosyan, T. (2012). Bank size, market concentration, and bank earnings volatility in the US. *Journal of International Financial Markets, Institutions and Money*, 22(1), 35-54.
- De Leeuw, E. D. (2008). Choosing the method of data collection. *International Handbook of Survey Methodology* (pp. 113-135). New York: Taylor & Francis Group, European Association of Methodology (EM) book series.
- Dedu, V., Nițescu, D.-C., & Cristea, M.-A. (2021). The impact of macroeconomic, social and governance factors on the sustainability and well-being of the economic environment and the robustness of the banking system. *Sustainability*, 13(10), 5713.
- Dia, M., Golmohammadi, A., & Takouda, P. M. (2020). Relative efficiency of Canadian banks: A three-stage network bootstrap DEA. *Journal of Risk and Financial Management*, 13(4), 68.
- Dimitras, A. I., Gaganis, C., & Pasiouras, F. (2018). Financial reporting standards' change and the efficiency measures of EU banks. *International Review of Financial Analysis*, 59, 223-233.
- Dinçer, Ö., & Altınay, A. (2022). The effect of declarations of sustainability reports on financial performances of banks in Turkey. *International Journal of Business and Economic Studies*, 4(2), 112–126.
- Ding, D., & Sickles, R. C. (2019). Capital regulation, efficiency, and risk taking: A spatial panel analysis of US banks. In *Panel Data Econometrics* (pp. 405-466). Elsevier.
- Disyatat, P. (2011). The bank lending channel revisited. *Journal of Money, Credit and Banking*, 43(4), 711-734.
- Domanović, V., Todorović, V., & Savović, S. (2018). Internal factors of bank profitability in the republic of Serbia. *Business & Economic Horizons*, 14(3).

- Dong, Y., Meng, C., Firth, M., & Hou, W. (2014). Ownership structure and risk-taking: Comparative evidence from private and state-controlled banks in China. *International Review of Financial Analysis*, 36, 120-130.
- Du, Y., & Kim, P. H. (2021). One size does not fit all: Strategy configurations, complex environments, and new venture performance in emerging economies. *Journal of Business Research*, 124, 272-285.
- Dulock, H. L. (1993). Research design: Descriptive research. *Journal of Pediatric Oncology Nursing*, 10(4), 154-157.
- Duygun, M., Shaban, M., Sickles, R. C., & Weyman-Jones, T. (2015). How a regulatory capital requirement affects banks' productivity: an application to emerging economies. *Journal of Productivity Analysis*, 44, 237-248.
- Ebiringa, O. T., & Anyaogu, N. B. (2014). Exchange rate, inflation and interest rates relationships: An autoregressive distributed lag analysis. *Journal of Economics and Development Studies*, 2(2), 263-279.
- EcoMatcher. (2022). *Mental Models to Surpass While Investing in ESG*. <https://www.ecomatcher.com/mental-models-to-surpass-while-investing-in-esg/>
- Edgeworth, F. Y. (1881). *Mathematical psychics: An essay on the application of mathematics to the moral sciences* (Vol. 10). CK Paul.
- El Khoury, R., Nasrallah, N., & Alareeni, B. (2023). ESG and financial performance of banks in the MENAT region: concavity–convexity patterns. *Journal of Sustainable Finance & Investment*, 13(1), 406-430.
- El Moussawi, C., & Obeid, H. (2011). Evaluating the productive efficiency of Islamic banking in GCC: A non-parametric approach. *International Management Review*, 7(1), 10-21.

- Fang, Y. (2021). *Sustainability information network (SIN) and corporate financial distress*. Queensland University of Technology.
- Ferreira, A., & Otley, D. (2010). Design and use of management control systems: An analysis of the interaction between design misfit and intensity of use. *CIPFA (Chartered Institute of Public Finance and Accountancy), London*.
- Fixler, & Zieschang. (1993). An index number approach to measuring bank efficiency: An application to mergers. *Journal of Banking & Finance*, 17(2–3), 473-450.
- Fioramonti, L., Coscieme, L., & Mortensen, L. F. (2019). From gross domestic product to wellbeing: How alternative indicators can help connect the new economy with the Sustainable Development Goals. *The Anthropocene Review*, 6(3), 207-222.
- Fleming, J., & Zegwaard, K. E. (2018). Methodologies, methods and ethical considerations for conducting research in work-integrated learning. *International Journal of Work-Integrated Learning*, 19(3), 205-213.
- Friedman, M. (1970). Controls on interest rates paid by banks. *Journal of Money, Credit and Banking*, 2(1), 15-32.
- Gakono, P. (2021). *The Effect of Financial Leverage on Profitability of Commercial Services Firms in Nairobi Securities Exchange* University of Nairobi.
- Galletta, S., Goodell, J. W., Mazzù, S., & Paltrinieri, A. (2023). Bank reputation and operational risk: The impact of ESG. *Finance Research Letters*, 51, 103494.
- Galletta, S., & Mazzù, S. (2023). ESG controversies and bank risk taking. *Business Strategy and the Environment*, 32(1), 274-288.
- Galletta, S., Mazzù, S., Naciti, V., & Vermiglio, C. (2022). Gender diversity and sustainability performance in the banking industry. *Corporate Social Responsibility and Environmental Management*, 29(1), 161-174.

- Garza-García, J. G. (2012). Determinants of bank efficiency in Mexico: A two-stage analysis. *Applied Economics Letters*, 19(17), 1679-1682.
- Ghosh, S. (2014). Risk, capital and financial crisis: Evidence for GCC banks. *Borsa Istanbul Review*, 14(3), 145-157.
- Grewatsch, S., & Kleindienst, I. (2017). When does it pay to be good? Moderators and mediators in the corporate sustainability–corporate financial performance relationship: A critical review. *Journal of business ethics*, 145, 383-416.
- Grigorian, D. A., & Manole, V. (2002). r. IMF Working Paper.
- Guillén, J., Rengifo, E. W., & Ozsoz, E. (2014). Relative power and efficiency as the main determinant of banks' profitability in Latin America. *Borsa Istanbul Review*, 14(2), 119–125.
- Gujarati, D. N. (2022). *Basic econometrics*. Prentice Hall.
- Gunawan, J., Permatasari, P., & Sharma, U. (2022). Exploring sustainability and green banking disclosures: a study of banking sector. *Environment, Development and Sustainability*, 24(9), 11153-11194.
- Haan, J.D. & Poghosyan, T. (2012). Bank size, market concentration, and bank earnings volatility in the US. *Journal of International Financial Markets, Institutions & Money*, 22, 35-54.
- Habib, R. I., Madni, A., & Akhtar, N. (2020). Role of banks in money laundering through fake bank accounts and writing off loan in Pakistan: An analytical study. *Journal of Accounting and Finance in Emerging Economies*, 6(1), 183-190.
- Hakenes, H., Hasan, I., Molyneux, P., & Xie, R. (2015). Small banks and local economic development. *Review of Finance*, 19(2), 653-683.

- Hancock, D. (1985). Bank profitability, interest rates, and monetary policy. *Journal of Money, Credit and Banking*, 17(2), 189-202.
- Hang, N. T., Huy, D. T. N., Ha, L., & Nhung, D. (2021). Better risk management of banks and sustainability-a case study in Vietnam. *Revista Geintec-Gestao Inovacao E Tecnologias*, 481-490.
- Haris, M., Tan, Y., Malik, A., & Ain, Q. U. (2020). A study on the impact of capitalization on the profitability of banks in emerging markets: A case of Pakistan. *Journal of Risk and Financial Management*, 13(9), 217.
- Hasan, I., & Marton, K. (2003). Development and efficiency of the banking sector in a transitional economy: Hungarian experience. *Journal of Banking & Finance*, 27(12), 2249-2271.
- Hassan, M. K. (2006). The X-efficiency in Islamic banks. *Islamic Economic Studies*, 13(2).
- Hatmanu, M., Cautisanu, C., & Ifrim, M. (2020). The impact of interest rate, exchange rate and European business climate on economic growth in Romania: An ARDL approach with structural breaks. *Sustainability*, 12(7), 2798.
- Havrylchyk, O. (2006). Efficiency of the Polish banking industry: Foreign versus domestic banks. *Journal of Banking & Finance*, 30(7), 1975-1996.
- Hepelwa, A. S. (2013). Technical efficiency as a sustainability indicator in continuum of integrated natural resources management. *Resources and Environment*, 3(6), 194-203.
- Hermes, N., & Nhung, V. T. H. (2010). The impact of financial liberalization on bank efficiency: evidence from Latin America and Asia. *Applied Economics*, 42(26), 3351-3365.

- Hongbo, Y., & Fangfang, L. (2010, May). Analysis of bank performance appraisal based on the contingency theory. In *2010 International Conference on E-Business and E-Government* (pp. 911-914). IEEE.
- Horváth, R., Seidler, J., & Weill, L. (2014). Bank capital and liquidity creation: Granger-causality evidence. *Journal of Financial Services Research*, 45, 341-361.
- Hou, X., Wang, Q., & Zhang, Q. (2014). Market structure, risk taking, and the efficiency of Chinese commercial banks. *Emerging Markets Review*, 20, 75-88.
- Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. *Journal of Financial Economics*, 96(3), 485-512.
- Howard, L. C. (2014). *Contingency Theories and Globalization* [Slideshare Presentation]. Seminar Unit #3. <https://slideplayer.com/slide/6402368/>
- Hsiao, C. (2022). *Analysis of panel data*. Cambridge university press.
- Hsiao, C. & Pesaran, M.H. & Pick, A.. (2007). *Diagnostic Tests of Cross Section Independence for Nonlinear Panel Data Models*. Cambridge Working Papers in Economics 07.17, Faculty of Economics, University of Cambridge. DOI:10.2139/ssrn.982629
- Hughes, J. P., & Mester, L. J. (2008). Efficiency in banking: theory, practice, and evidence.
- Huy, D. T. N., Thach, N. N., Chuyen, B. M., Nhung, P. T. H., Tran, D. T., & Tran, T. A. (2021). Enhancing risk management culture for sustainable growth of Asia commercial bank-ACB in Vietnam under mixed effects of macro factors. *Entrepreneurship and Sustainability Issues*, 8(3), 291.
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53-74.

- Ioan, B., Malar Kumaran, R., Larissa, B., Anca, N., Lucian, G., Gheorghe, F., Horia, T.,
Ioan, B., & Mircea-Iosif, R. (2020). A panel data analysis on sustainable economic growth in India, Brazil, and Romania. *Journal of Risk and Financial Management*, 13(8), 170.
- Ishtiaq, M. (2015), *Risk Management in Banks: Determination of Practices and Relationship with Performance* (Doctoral thesis, University of Bedfordshire), Bedfordshire. Repository University of Bedfordshire <http://hdl.handle.net/10547/584264>
- Isnurhadi, I., Adam, M., Sulastri, S., Muizzuddin, M., & Andriana, I. (2023). Similarity Result of Bank Capital, Efficiency and Risk: Evidence from Islamic Banks. *Journal of Asian Finance, Economics and Business*, 8(1), 841-850.
- Jaffé, W. (1972). Pareto translated: a review article. *Journal of Economic Literature*, 10(4), 1190-1201.
- Janoudi, S. (2014). Banking Efficiency and Risk in the European Union Banking System: The Effect of the World Financial Crisis. *Available at SSRN 2513249*.
- Jeon, J. Q., & Lim, K. K. (2013). Bank competition and financial stability: A comparison of commercial banks and mutual savings banks in Korea. *Pacific-Basin Finance Journal*, 25, 253-272.
- Johnes, J., Izzeldin, M., & Pappas, V. (2014). A comparison of performance of Islamic and conventional banks 2004–2009. *Journal of Economic Behavior & Organization*, 103, S93-S107.
- Jones, M. C. (1994). Expectiles and M-quantiles are quantiles. *Statistics & Probability Letters*, 20(2), 149-153.

- Jyoti, G., & Khanna, A. (2021). Does sustainability performance impact financial performance? Evidence from Indian service sector firms. *Sustainable Development*, 29(6), 1086-1095.
- Kamal, S. (2019). Research paradigm and the philosophical foundations of a qualitative study. *PEOPLE: International Journal of Social Sciences*, 4(3), 1386-1394.
- Kamarudin, F., Sufian, F., Nassir, A. M., Anwar, N. A. M., & Hussain, H. I. (2019). Bank efficiency in Malaysia a DEA approach. *Journal of Central Banking Theory and Practice*, 8(1), 133-162.
- Karfakis, C., & Kim, S.-J. (1995). Exchange rates, interest rates and current account news: some evidence from Australia. *Journal of International Money and Finance*, 14(4), 575-595.
- Keshtgar, N., Pahlavani, M., & Mirjalili, S. H. (2020). The impact of exchange rate volatility on banking performance (case of Iran). *International Journal of Business and Development Studies*, 12(1), 39-56.
- Ketokivi, M., & Mantere, S. (2010). Two strategies for inductive reasoning in organizational research. *Academy of Management Review*, 35(2), 315-333.
- Khalid, K., Abdullah, H. H., & Kumar M, D. (2012). Get along with quantitative research process. *International Journal of Research in Management*, 2(2), 15-29.
- Khan, Q. M., Kauser, R., & Abbas, U. (2015). Impact of bank specific and macroeconomic factors on banks profitability: a study on banking sector of Pakistan. *Journal of Accounting and Finance in Emerging Economies*, 1(2), 99-110.
- Kluza, K., Ziolo, M., & Spoz, A. (2021). Innovation and environmental, social, and governance factors influencing sustainable business models-Meta-analysis. *Journal of Cleaner Production*, 303, 127015.

- Köhler, M. (2015). Which banks are more risky? The impact of business models on bank stability. *Journal of Financial Stability*, 16, 195-212.
- Korzeb, Z., & Samaniego-Medina, R. (2019). Sustainability performance. A comparative analysis in the polish banking sector. *Sustainability*, 11(3), 653.
- KPPHGN, M., Arulrajah, A. A., & Senthilnathan, S. (2020). Mediating Role Of Employee Green Behaviour Towards Sustainability Performance Of Banks. *Journal of Governance and Regulation*, 9(2), 92-102.
- Krishna, B., Lingam, S., Mala, A., & Sen, R. (2021). Determinants of Bank Profitability: Empirical Evidence From a Pacific Small Island Developing State. *Humanities & Social Science Review*, 9 (3), 16-29.
- Kumar, K., & Prakash, A. (2019). Developing a framework for assessing sustainable banking performance of the Indian banking sector. *Social Responsibility Journal*, 15(5), 689-709.
- Lawless, H. T., Heymann, H., Lawless, H. T., & Heymann, H. (2010). Descriptive analysis. *Sensory Evaluation of Food: Principles and Practices*, 227-257.
- Lee, T.-H., & Chih, S.-H. (2013). Does financial regulation affect the profit efficiency and risk of banks? Evidence from China's commercial banks. *The North American Journal of Economics and Finance*, 26, 705-724.
- Leonidou, L. C., Fotiadis, T. A., Christodoulides, P., Spyropoulou, S., & Katsikeas, C. S. (2015). Environmentally friendly export business strategy: Its determinants and effects on competitive advantage and performance. *International Business Review*, 24(5), 798-811.
- Lepetit, L., & Strobel, F. (2013). Bank insolvency risk and time-varying Z-score measures. *Journal of International Financial Markets, Institutions and Money*, 25, 73-87.

- Levin, A., Lin, C.-F., & Chu, C.-S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1-24.
- Li, S., Easterby-Smith, M., & Bartunek, J. (2009). Research methods for organizational learning: The transatlantic gap. *Management Learning*, 40(4), 439-447.
- Li, S. K., Tsang, C. K., & Lee, S. K. (2021). Sustainable development of the China tourism sector: Implications from technical and scale efficiency measurements. *The Chinese Economy*, 54(4), 262-271.
- Lin, X., & Zhang, Y. (2009). Bank ownership reform and bank performance in China. *Journal of Banking & Finance*, 33(1), 20-29.
- Ma, Y., Men, J., Li, M., & Li, X. (2021). Sustainable performance evaluation: evidence from listed chinese mining corporations. *Entropy*, 23(3), 349.
- Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61(S1), 631-652.
- Malsha, K., Arulrajah, A. A., & Senthilnathan, S. (2020). Mediating Role Of Employee Green Behaviour Towards Sustainability Performance Of Banks. *Journal of Governance and Regulation*, 9(2), 92-102.
- Mamatzakis, E., Matousek, R., & Vu, A. N. (2016). What is the impact of bankrupt and restructured loans on Japanese bank efficiency? *Journal of Banking & Finance*, 72, S187-S202.
- Marie, A. A., Ibrahim, M. E., & Al Nasser, A. D. (2014). Effects of financial and non-financial performance measures on customers' perceptions of service quality at Islamic Banks in UAE. *International Journal of Economics and Finance*, 6(10), 201-213.

- Matey, J. (2021). Bank liquidity risk and bank credit risk: Implication on bank stability in Ghana. *International Journal of Scientific Research in Multidisciplinary Studies*, 7(4), 01-09.
- McGuire, J. B., Sundgren, A., & Schneeweis, T. (1988). Corporate social responsibility and firm financial performance. *Academy of Management Journal*, 31(4), 854-872.
- Mollah, S., & Zaman, M. (2015). Shari'ah supervision, corporate governance and performance: Conventional vs. Islamic banks. *Journal of Banking & Finance*, 58, 418-435.
- Mukhtar, A. (2018). Money laundering, terror financing and FATF: Implications for Pakistan. *Journal of Current Affairs*, 3(1), 27-56.
- Nadal, A. (2011). Macroeconomic Policies, Livelihoods & Sustainability. Mexico.
- Nepomuceno, T. C. C., Daraio, C., & Costa, A. P. C. S. (2020). Combining multi-criteria and directional distances to decompose non-compensatory measures of sustainable banking efficiency. *Applied Economics Letters*, 27(4), 329-334.
- Nguyen, M., Skully, M., & Perera, S. (2012). Market power, revenue diversification and bank stability: Evidence from selected South Asian countries. *Journal of International financial Markets, Institutions and Money*, 22(4), 897-912.
- Nidumolu, R., Prahalad, C. K., & Rangaswami, M. R. (2009). Why sustainability is now the key driver of innovation. *Harvard Business Review*, 87(9), 56-64.
- Nizam, E., Ng, A., Dewandaru, G., Nagayev, R., & Nkoba, M. A. (2019). The impact of social and environmental sustainability on financial performance: A global analysis of the banking sector. *Journal of Multinational Financial Management*, 49, 35-53.

- Nollet, J., Filis, G., & Mitrokostas, E. (2016). Corporate social responsibility and financial performance: A non-linear and disaggregated approach. *Economic Modelling*, 52, 400-407.
- Noor, M. A. N. M., & Ahmad, N. H. B. (2011). Relationship between Islamic banking profitability and determinants of efficiency. *IUP Journal of Managerial Economics*, 9(3), 43.
- Nosratabadi, S., Pinter, G., Mosavi, A., & Semperger, S. (2020). Sustainable banking; evaluation of the European business models. *Sustainability*, 12(6), 2314.
- Nsambu, K. F. (2014). Factors affecting performance of commercial banks in Uganda a case for domestic commercial banks. Proceedings of 25th International Business Research Conference (pp.1-19). <https://text2fa.ir/wp-content/uploads/Text2fa.ir-Factors-Affecting-Performance-of-Commercial-Banks-in-Uganda-1.pdf>
- Obstfeld, M., & Rogoff, K. (1995). The intertemporal approach to the current account. *Handbook of International Economics*, 3, 1731-1799.
- Ong, T. S., Teh, B. H., & Lee, A. S. (2019). Contingent factors and sustainable performance measurement (SPM) practices of Malaysian electronics and electrical companies. *Sustainability*, 11(4), 1058.
- Orazalin, N., Mahmood, M., & Narbaev, T. (2019). The impact of sustainability performance indicators on financial stability: evidence from the Russian oil and gas industry. *Environmental Science and Pollution Research*, 26, 8157-8168.
- Otker-Robe, I., & Podpiera, A. M. (2013). The social impact of financial crises: evidence from the global financial crisis. *World bank Policy Research Working paper 6703*, SSRN, 1-34. <https://ssrn.com/abstract=2354754>

- Otley, D. T. (1980). The contingency theory of management accounting: achievement and prognosis. *Accounting, Organizations and Society*, 5(4), 413-428.
- Özçelik, F., & AVCI ÖZTÜRK, B. (2014). Evaluation of banks' sustainability performance in Turkey with grey relational analysis. *Journal of Accounting & Finance*, 63, 189-209.
- PACRA. (2021). *Banks Sector Report 2021*. <https://www.pacra.org.zm/wp-content/uploads/2022/04/PACRA-ANNUAL-REPORT-2021-FINAL.pdf>
- Pampurini, F., & Quaranta, A. G. (2018). Sustainability and efficiency of the European banking market after the global crisis: The impact of some strategic choices. *Sustainability*, 10(7), 2237.
- Pasiouras, F. (2008). Estimating the technical and scale efficiency of Greek commercial banks: the impact of credit risk, off-balance sheet activities, and international operations. *Research in International Business and Finance*, 22(3), 301-318.
- Pasiouras, F., & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, 21(2), 222-237.
- Pereira, M. A., & Marques, R. C. (2021). Technical and scale efficiency of the Brazilian municipalities' water and sanitation services: A two-stage data envelopment analysis. *Sustainability*, 14(1), 199.
- Pareto. (1927). *Manuel d'Economie Politique* (2nd Editio). Giard et Brier.
- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.
- Pesaran, M. H. (2015). Testing weak cross-sectional dependence in large panels. *Econometric Reviews*, 34(6-10), 1089-1117.

- Pesaran, M. H. (2021). General diagnostic tests for cross-sectional dependence in panels. *Empirical Economics*, 60(1), 13-50. <https://doi.org/10.1007/s00181-020-01875-7>
- Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: evidence from EU 27 banking systems. *Procedia Economics and Finance*, 20, 518-524.
- Phan, T. T. H., Tran, H. X., Le, T. T., Nguyen, N., Pervan, S., & Tran, M. D. (2020). The relationship between sustainable development practices and financial performance: A case study of textile firms in Vietnam. *Sustainability*, 12(15), 5930.
- Portillo-Tarragona, P., Scarpellini, S., Moneva, J. M., Valero-Gil, J., & Aranda-Usón, A. (2018). Classification and measurement of the firms' resources and capabilities applied to eco-innovation projects from a resource-based view perspective. *Sustainability*, 10(9), 3161.
- Puspitasari, E., Sudiyatno, B., Hartoto, W. E., & Widati, L. W. (2021). Net interest margin and return on assets: A Case Study in Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(4), 727-734.
- Quan, L. J., Ramasamy, S., Rasiah, D., Yen, Y. Y., & Pillay, S. D. (2019). Determinants of Islamic banking performance: An empirical study in Malaysia (2007 to 2016). *Humanities & Social Sciences Reviews*, 7(6), 380-401.
- Raible, K.-F. (2016). TR Strategic Incentive Plan Designs Encourage Insurers to Take Smart Risks. *Willis Towers Watson: London, UK*.
- Rashid, A., & Jabeen, S. (2016). Analyzing performance determinants: Conventional versus Islamic banks in Pakistan. *Borsa Istanbul Review*, 16(2), 92-107.
- Rebai, S., Azaiez, M. N., & Saidane, D. (2012). Sustainable performance evaluation of banks using a multi-attribute utility model: an application to French banks. *Procedia Economics and Finance*, 2, 363-372.

- Rehman, R., & Raoof, A. (2010). Efficiencies of the Pakistani banking sector: A comparative study. *International Research Journal of Finance and Economics* (46), 110-129.
- Rehman, H., Ramzan, M., Haq, M. Z. U., Hwang, J., & Kim, K.-B. (2021). Risk management in corporate governance framework. *Sustainability*, 13(9), 5015.
- Rosman, R., Abd Wahab, N., & Zainol, Z. (2014). Efficiency of Islamic banks during the financial crisis: An analysis of Middle Eastern and Asian countries. *Pacific-Basin Finance Journal*, 28, 76-90.
- Ruiz, B., García, J. A., & Revilla, A. J. (2016). Antecedents and consequences of bank reputation: a comparison of the United Kingdom and Spain. *International Marketing Review*, 33(6), 781-805.
- Ruslan, A., Pahlevi, C., Alam, S., Nohong, M., & Reni, A. (2019). Determinants of banking efficiency and its impact on banking competitive advantage. 3rd international conference on accounting, management and economics 2018 (ICAME 2018) (pp. 371-379). Atlantis Press. <https://www.atlantis-press.com/proceedings/icame-18/125917145>.
- Sadjadi, H., Hamidian, M., Esmaeilzadeh, A., & Talebniya, G. (2022). Evaluating long-term performance of commercial banks from sustainable competitive advantage perspective, focusing on role of management efficiency: Comparison of Iranian private and public banks. *International Journal of Finance & Managerial Accounting*, 7(24), 251-264.
- Saeed, M. S. (2014). Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Research Journal of Finance and Accounting*, 5(2), 42-50.

- Saghir, G., & Ch, E. T. (2020). Risk Management & Financial Performance of Commercial Banks in Pakistan. *Lahore Journal of Business*, 9(1), 87-103.
- Saïdane, D., & Abdallah, S. B. (2020). Sustainability and financial stability: Evidence from European banks. *Economics Bulletin*, 40(2), 1769-1780.
- Saiful, S. (2017). Contingency Factors, Risk Management, and Performance of Indonesian Banks. *Asian Journal of Finance & Accounting*, 9(1), 35-53.
- Samuelson, P. A. (1945). The effect of interest rate increases on the banking system. *The American Economic Review*, 35(1), 16-27.
- San-Jose, L., Retolaza, J. L., & Lamarque, E. (2018). The social efficiency for sustainability: European cooperative banking analysis. *Sustainability*, 10(9), 3271.
- Sathye, M. (2003). Efficiency of banks in a developing economy: The case of India. *European Journal of Operational Research*, 148(3), 662-671.
- Saunders, M., Lewis, P., & Thornhill, A. (2007). Research methods. *Business students 4th edition Pearson Education Limited, England*, 6(3), 1-268.
- Saunders, M., Lewis, P., & Thornhill, A. (2019). Research Methods for Business Students Eight Edition. *Qualitative Market Research*. Pearson education.
- SBP. (2017). Enterprise Technology Governance & Risk Management Framework for Financial Institutions. *State Bank of Pakistan*, (05). retrieved from <https://www.sbp.org.pk/bprd/2017/C5-Annex.pdf>
- SBP. (2021). *State Bank- Member Financial Institutions*. Retrieved from <https://www.sbp.org.pk/ecib/members.htm>
- Schabek, T. (2020). The financial performance of sustainable power producers in emerging markets. *Renewable Energy*, 160, 1408-1419.

- Schaeck, K., & Cihák, M. (2014). Competition, efficiency, and stability in banking. *Financial Management*, 43(1), 215-241.
- Scholtens, B., & van't Klooster, S. (2019). Sustainability and bank risk. *Palgrave Communications*, 5(1), 1-8.
- Sekaran, U., & Bougie, R. (2010). *Research Methods for Business: A Skill Building Approach (5th edition)*. New Jersey: John Wiley & Sons.
- Semih Yildirim, H., & Philippatos, G. C. (2007). Efficiency of banks: Recent evidence from the transition economies of Europe, 1993–2000. *European Journal of Finance*, 13(2), 123-143.
- Serafimova, K., & Vellacott, T. (2015). Prepared for the Future? ESG Competences Are Key. *Responsible Investment Banking: Risk Management Frameworks, Sustainable Financial Innovation and Softlaw Standards*, 601-607.
- Shah, A. A., Wu, D., & Korotkov, V. (2019). Are sustainable banks efficient and productive? A data envelopment analysis and the Malmquist productivity index analysis. *Sustainability*, 11(8), 2398.
- Sharma, D. (2018). Stock market performance and efficiency of banks in a developing economy: evidence from the Indian banking sector. *IIM Kozhikode Society & Management Review*, 7(2), 178-193.
- Shephard, R. W. (1953). *Cost and Production Functions*. Princeton University Press. Princeton, New Jersey.
- Shiller, R. J., & McCulloch, J. H. (1987). *The Term Structure of Interest Rates (with US Government Term Structure Data)*. Cowles Foundation Discussion Papers. 1086. Yale University EliScholar. <https://elischolar.library.yale.edu/cowles-discussion-paper-series/108>.

- Sikandar, A., Siddiqui, N. N., & Azhar, K. A. (2021). Impact of financial leverage on firm's profitability: An investigation from the banking sector of Pakistan. *Bahria University Journal of Humanities & Social Sciences (BUJHSS) Financial Economics*, 116-127.
- Sjö, B. (2008). Testing for unit roots and cointegration. *Lectures in Modern Econometric Time series Analysis*.
- Smaoui, H., & Salah, I. B. (2012). Profitability of Islamic banks in the GCC region. *Global Economy and Finance Journal*, 5(1), 85-102.
- Sørensen, B. E. (2005). Cointegration. URL: [http://141.217, 212](http://141.217.212).
- Spong, K., Sullivan, R. J., & DeYoung, R. (1995). What makes a bank efficient? A look at financial characteristics and bank management and ownership structure. *Federal Reserve Bank of Kansas City, Financial Industry Perspectives, December*, 1-19.
- Srairi, S. (2013). Ownership structure and risk-taking behaviour in conventional and Islamic banks: Evidence for MENA countries. *Borsa Istanbul Review*, 13(4), 115-127.
- Stauropoulou, A., & Sardianou, E. (2019). Understanding and measuring sustainability performance in the banking sector. IOP Conference Series: Earth and Environmental Science (pp.1-11). IOP Publishing. doi:10.1088/1755-1315/362/1/012128.
- Sufian, F. (2007). The efficiency of Islamic banking industry in Malaysia: Foreign vs domestic banks. *Humanomics*, 23(3), 174-192.
- Sufian, F. (2009). Determinants of bank efficiency during unstable macroeconomic environment: Empirical evidence from Malaysia. *Research in International Business and Finance*, 23(1), 54-77.
- Sufian, F. (2016). Determinants of efficiency in the Malaysian banking sector: Evidence from semi-parametric data envelopment analysis method. *Studies in Microeconomics*, 4(2), 151-172.

- Sufian, F., & Habibullah, M. S. (2009a). Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. *Frontiers of Economics in China*, 4(2), 274-291.
- Sufian, F., & Habibullah, M. S. (2009b). Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh. *Journal of Business Economics and Management*, 10(3), 207-217.
- Sufian, F., & Habibullah, M. S. (2009c). Asian Financial Crisis and the Evolution of Korean Banks Efficiency: A DEA Approach. *Global Economic Review*, 38(4), 335–369.
- Tabak, B. M., Gomes, G. M., & da Silva Medeiros Jr, M. (2015). The impact of market power at bank level in risk-taking: The Brazilian case. *International Review of Financial Analysis*, 40, 154-165.
- Taiwo, O., & Adesola, O. A. (2013). Exchange rate volatility and bank performance in Nigeria. *Asian Economic and Financial Review*, 3(2), 178.
- Tampakoudis, I. (2013). Examining the Linkages between GDP Growth and Sustainable Development in the Eurozone'. *Aristidis Bitzenis Vasileios A. Vlachos*(37).
- Tan, Y., & Floros, C. (2013). Risk, capital and efficiency in Chinese banking. *Journal of international financial Markets, Institutions and Money*, 26, 378-393.
- Thaddeus, E. and Nnneka, A. (2014). Exchange Rate, Inflation, and Interest Rates Relationships: AnAutoregressive Distributed Lag Analysis. *Journal of Economics and Development Studies*, 2 (2), 263-279.
- Torre Olmo, B., Cantero Saiz, M., & Sanfilippo Azofra, S. (2021). Sustainable banking, market power, and efficiency: Effects on banks' profitability and risk. *Sustainability*, 13(3), 1298.

- Torugsa, N. A., O'Donohue, W., & Hecker, R. (2013). Proactive CSR: An empirical analysis of the role of its economic, social and environmental dimensions on the association between capabilities and performance. *Journal of Business Ethics*, 115, 383-402.
- Tsindeliani, I. A., Proshunin, M. M., Sadovskaya, T. D., Popkova, Z. G., Davydova, M. A., & Babayan, O. A. (2022). Digital transformation of the banking system in the context of sustainable development. *Journal of Money Laundering Control*, 25(1), 165-180.
- Tugcu, C. T. (2018). Panel data analysis in the energy-growth nexus (EGN). In *The Economics and Econometrics of the Energy-Growth Nexus*, Elsevier, 255-271.
- Úbeda, F., Forcadell, F. J., Aracil, E., & Mendez, A. (2022). How sustainable banking fosters the SDG 10 in weak institutional environments. *Journal of Business Research*, 146, 277-287.
- Umar, M., Ji, X., Mirza, N., & Rahat, B. (2021). The impact of resource curse on banking efficiency: Evidence from twelve oil producing countries. *Resources Policy*, 72, 1-6.
- Van Beurden, P., & Gössling, T. (2008). The worth of values—a literature review on the relation between corporate social and financial performance. *Journal of business Ethics*, 82, 407-424.
- Van Maanen, J. (1983). *Qualitative Methods Reclaimed*. Alfred P. Sloan School of Management Massachusetts Institute of Technology.
<https://apps.dtic.mil/sti/citations/ADA134640>
- Vijayamohanan Pillai, N. (2016). Panel data analysis with Stata Part 1 fixed effects and random effects models. *MPRA Paper*, 76869.
- Vu, H., & Nahm, D. (2013). The determinants of profit efficiency of banks in Vietnam. *Journal of the Asia Pacific Economy*, 18(4), 615-631.

- Wang, Y., Xiuping, S., & Zhang, Q. (2021). Can fintech improve the efficiency of commercial banks?—An analysis based on big data. *Research in international business and finance*, 55, 101338.
- Wanke, P., & Barros, C. (2014). Two-stage DEA: An application to major Brazilian banks. *Expert Systems with Applications*, 41(5), 2337-2344.
- Weber, O. (2005). Sustainability benchmarking of European banks and financial service organizations. *Corporate Social Responsibility and Environmental Management*, 12(2), 73-87.
- Weber, O., & Chowdury, R. K. (2020). Corporate sustainability in Bangladeshi Banks: Proactive or reactive ethical behavior? *Sustainability*, 12(19), 7999.
- Werner, R. A. (2016). A lost century in economics: Three theories of banking and the conclusive evidence. *International Review of Financial Analysis*, 46, 361-379.
- Werner, R. A. (2012). Towards a new research programme on ‘banking and the Economy’ — Implications of the quantity theory of credit for the prevention and resolution of banking and debt crises. *International Review of Financial Analysis*, 25, 94–105.
- William, G. (2018). *Econometric Analysis*. 8th Edition, Pearson Education Limited, London.
- Williams, B. (2014). Bank risk and national governance in Asia. *Journal of Banking & finance*, 49, 10-26.
- Woodward, J. (1958). *Management and technology*. HM Stationery Office.
- Worthington, A., & Higgs, H. (2007). Evidence of financial integration in Asia: An empirical application of panel unit root tests and multivariate cointegration and causality procedures. School of Accounting & Finance, University of Wollongong, Working Paper 9. <https://ro.uow.edu.au/accfinwp/9/>

- Wozniowska, G. (2008). Methods of measuring the efficiency of commercial banks: an example of Polish banks. *Ekonomika*, 84, 81–91.
- Xu, X., & Zhou, Y. (2021). Efficiency evaluation of green innovation in Chinese eight comprehensive economic areas based on three-stage malmquist index. *Pol. J. Environ. Stud*, 30, 2863-2875.
- Xue, C., Zhou, H., Wu, Q., Wu, X., & Xu, X. (2021). Impact of incentive policies and other socio-economic factors on electric vehicle market share: A panel data analysis from the 20 countries. *Sustainability*, 13(5), 2928.
- Yaffee, R. (2003). A primer for panel data analysis. *Connect: Information Technology at NYU*, 8(3), 1-11.
- Yahya, A. T., Akhtar, A., & Tabash, M. I. (2014). The impact of political instability, macroeconomic and bank-specific factors on the profitability of Islamic banks: An empirical evidence. *Investment Management and Financial Innovations* 14(4), 30-39.
- Yin, R. K. (1981). The case study as a serious research strategy. *Knowledge*, 3(1), 97-114.
- Young, W., & Tilley, F. (2006). Can businesses move beyond efficiency? The shift toward effectiveness and equity in the corporate sustainability debate. *Business Strategy and the Environment*, 15(6), 402-415.
- Yu, Z. (2017). *Efficiency and competition analysis in nine Asian banking industries* (Doctoral dissertation, Loughborough University). School of Business and Economics Loughborough. <https://core.ac.uk/download/pdf/288369199.pdf>
- Yudistira, D. (2004). Efficiency in Islamic banking: An empirical analysis of eighteen banks. *Islamic Economic Studies*, 12(1).

- Zaman, S. J. J. A. K. (2011). Determinants of bank profitability in Pakistan: Internal factor analysis. *Yaşar Üniversitesi E-Dergisi*, 6(23), 3794.
- Zhang, J., Wang, P., & Qu, B. (2012). Bank risk taking, efficiency, and law enforcement: Evidence from Chinese city commercial banks. *China Economic Review*, 23(2), 284-295.
- Zheng, C., Perhiar, S. M., Gilal, N. G., & Gilal, F. G. (2019). Loan loss provision and risk-taking behavior of commercial banks in Pakistan: A dynamic GMM approach. *Sustainability*, 11(19), 5209.
- Zheng, G.-W., Siddik, A. B., Masukujjaman, M., & Fatema, N. (2021). Factors affecting the sustainability performance of financial institutions in Bangladesh: The role of green finance. *Sustainability*, 13(18), 10165.
- Zulfikar, R., & STp, M. M. (2018). Estimation model and selection method of panel data regression: an overview of common effect, fixed effect, and random effect model. *JEMA: Jurnal Ilmiah Bidang Akuntansi*, 1-10.

APPENDICES

Appendix I

Details of Banks and Financial Institutions in Pakistan (Source: www.sbp.org.pk)

S.No.	Name of Banks
1	Al Baraka Bank (Pakistan) Limited.
2	Allied Bank Limited.
3	Askari Bank Limited.
4	Bank of China Limited Pakistan Operations
5	Bank Alfalah Limited.
6	Bank Al-Habib Limited.
7	BankIslami Pakistan Limited.
8	Citi Bank N.A.
9	Deutsche Bank A.G.
10	Dubai Islamic Bank Pakistan Limited.
11	Faysal Bank Limited.
12	First Women Bank Limited.
13	Habib Bank Limited.
14	Habib Metropolitan Bank Limited.
15	Industrial and Commercial Bank of China
16	Industrial Development Bank of Pakistan.
17	JS Bank Limited.
18	MCB Bank Limited.

19	MCB Islamic Bank Limited.
20	Meezan Bank Limited.
21	National Bank of Pakistan.
22	S.M.E. Bank Limited.
23	Samba Bank Limited.
24	Silk Bank Limited.
25	Sindh Bank Limited.
26	Soneri Bank Limited.
27	Standard Chartered Bank (Pakistan) Limited.
28	Summit Bank Limited.
29	The Bank of Khyber.
30	The Bank of Punjab.
31	The Punjab Provincial Cooperative Bank Limited.
32	United Bank Limited.
33	Zarai Taraqati Bank Limited.
S.No.	Name of Microfinance Banks
1	Advans Micro Finance Bank Limited.
2	APNA Micro Finance Bank Limited.
3	FINCA Micro Finance Bank Limited.
4	Khushhali Bank Limited.
5	Mobilink Microfinance Bank Limited.
6	NRSP Micro Finance Bank Limited.
7	Pak Oman Micro Finance Bank Limited.

8	Sindh Microfinance Bank Limited
9	Tameer Micro Finance Bank Limited.
10	The First Micro Finance Bank Limited.
11	U Micro Finance Bank Limited.
S.No.	Name of Development Financial Institutions (DFIs)
1	Bankers Equity Limited.
2	House Building Finance Company Limited.
3	PAIR Investment Company Limited.
4	Pak Brunei Investment Company Limited.
5	Pak Oman Investment Company Limited.
6	Pak-China Investment Company Limited.
7	Pakistan Kuwait Investment Company Limited.
8	Pak-Libya Holding Company Limited.
9	Punjab Small Industries Corporation.
10	Saudi Pak Industrial & Agricultural Investment Company Limited.
LIST OF NON-BANK FINANCIAL COMPANIES (NBFCs)	
S.No.	Name Leasing Companies
1	Capital Assets Leasing Corporation Limited.
2	Grays Leasing Limited.
3	Orix Leasing Pakistan Limited.
4	Primus Leasing Limited
5	Pak Gulf Leasing Company Limited.
6	Pakistan Industrial & Commercial Leasing Limited.

7	Saudi Pak Leasing Company Limited.
8	Security Leasing Corporation Limited.
9	SME Leasing Limited.
10	Khan Housing and Agriculture Network Limited.
S.No.	Name of Investment Banks
1	Escorts Investment Bank Limited.
2	First Credit & Investment Bank Limited.
3	First Dawood Investment Bank Limited.
4	Innovative Investment Bank Limited.
5	Security Investment Bank Limited.
6	Trust Investment Bank Limited.
7	Invest Capital Investment Bank Limited.
S.No.	Name of Modaraba Companies
1	Allied Rental Modaraba Limited.
2	Awwal Modaraba Management Limited
3	Al-Noor Modaraba Management (Pvt) Limited.
4	B.F Modaraba
5	B.R.R. Guardian Modaraba.
6	First Elite Capital Modaraba.
7	First Equity Modaraba.
8	First Fidelity Leasing Modaraba.
9	First Habib Modaraba.
10	First Tri Star Modaraba

11	First IBL Modaraba.
12	First National Bank Modaraba.
13	First Pak Modaraba.
14	First Paramount Modaraba.
15	First Prudential Modaraba.
16	First Punjab Modaraba.
17	First Udl Modaraba.
18	KASB Modaraba.
19	Modaraba Al-Mali.
20	Orient Rental Modaraba
21	Popular Islamic Modaraba.
22	Sindh Modaraba.
23	Standard Chartered Modaraba.
24	Trust Modaraba.
S.No.	Name of Funds
1	National Investment Trust Limited

Appendix II

Details of Categories of Banks in Pakistan

A. Public Sector Commercial Banks

1. First Women Bank Limited
2. National Bank of Pakistan
3. The Bank of Khyber
4. The Bank of Punjab
5. Sindh Bank Limited

B. Specialized Banks

1. Zarai Tarqati Bank Limited SME Bank Limited
2. Punjab Provincial Cooperative Bank Limited
3. Industrial Development Bank of Pakistan Limited

C. Local Private Banks

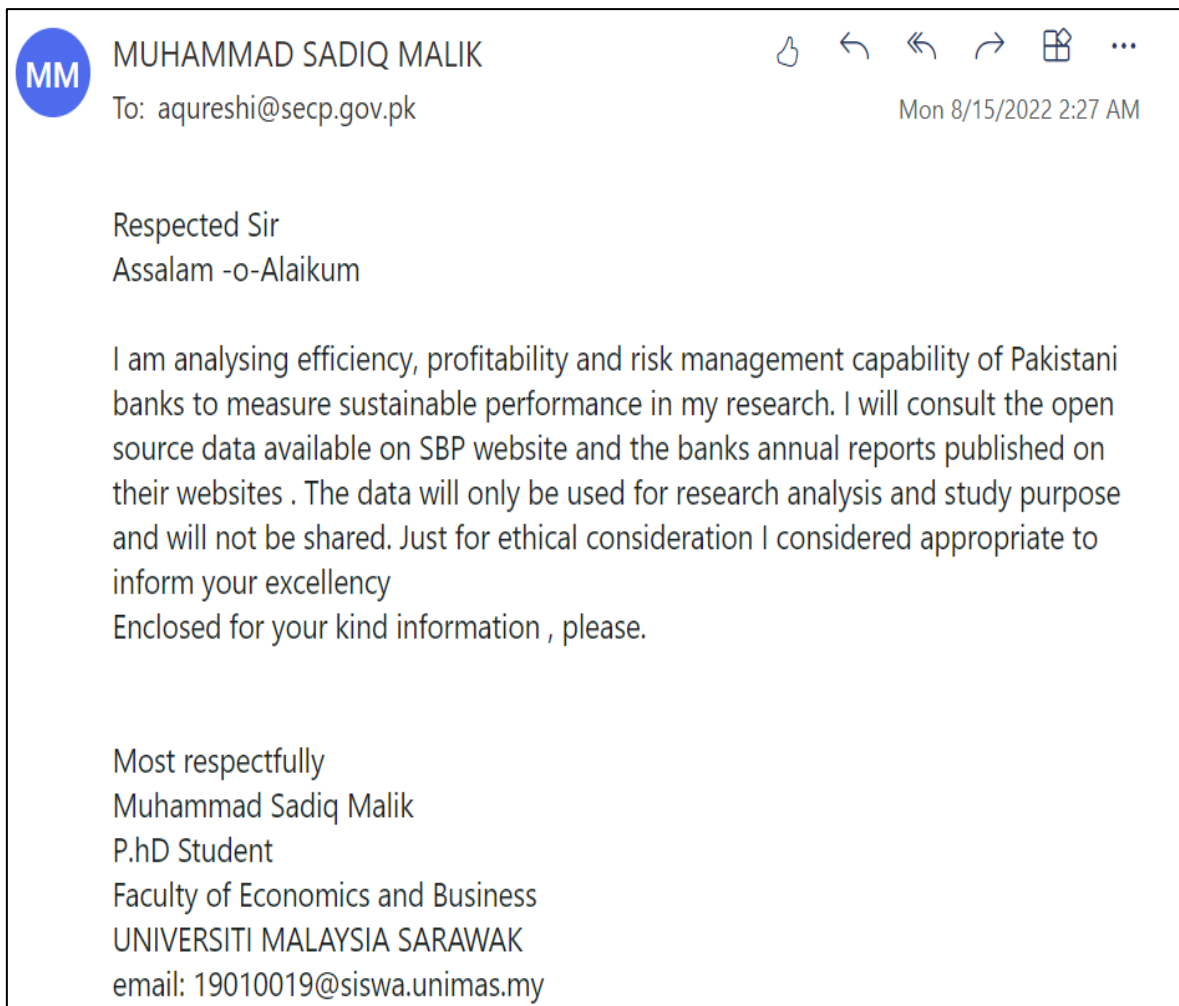
1. Habib Bank Limited
2. United Bank Limited
3. MCB Bank Limited
4. Allied Bank limited
5. Bank Al-Falah Limited
6. Bank Al-Habib Limited

7. Habib Metropolitan Bank Limited
8. JS Bank Limited
9. Faysal Bank Limited
10. Askari Bank Limited
11. Standard Chartered Bank (Pakistan) Limited
12. Soneri Bank Limited
13. SILKBANK Limited
14. Summit Bank Limited
15. Samba Bank Limited

D. Islamic Banks

1. Meezan Bank Limited
2. Al-Baraka Bank (Pakistan) Limited
3. Bank Islami Pakistan Limited
4. MCB Islamic Bank Limited
5. Dubai Islamic Bank Pakistan
6. Foreign Banks
7. Citi Bank N.A
8. Deutsche Bank AG
9. Industrial & Commercial Bank of China
10. Bank of China Limited

Appendix III



Appendix IV

Literature on determinants of efficiency in Banking

Studies (Efficiency)	Banks	Variables of Efficiency	Determinants of Efficiency and results
Rosman <i>et al.</i> (2014) 12 Middle Eastern countries (DEA) 2007-2010	Islamic	TE PTE SE	ROA (+), Size (+/-), Capital ratio (+), Credit Risk.
Noor and Ahmed (2012) 25 Countries (DEA) 1992-2009	Islamic	TE PTE SE	ROE, operating expenses/ total assets (+), Capital ratio (+), Size (+), Loan intensity (-), Market power (logarithm of deposits), Bank's market share (+), GDP (+), Inflation (-), Stock market capitalization, Asian financial crisis (+), Global financial crisis (-).
El-Moussawi and Obeid (2011) GCC countries (DEA and SFA) 2005-2008	Islamic	TE AE CE	GDP (-), Inflation (+), Capital ratio (-), Size (-), Credit risk (-), ROA (+/-).
Hassan (2006) 21 Countries (DEA) 1995-2001	Islamic	CE TE AE PTE SE	Total assets (+), ROA (+), ROE (+), Loans (+).
Yudistira (2004) (DEA) 12 Countries 1997-2000	Islamic	TE PTE SE	Risk taking propensity (+), ROA, Size (+), Market power (-), Location (Middle East dummy) (-), Publicly listed Islamic banks (-).
Stewart <i>et al.</i> (2016) Vietnam (DEA) 1999-2009	Commercial	TE PTE	ROA (+), Cost to assets ratio, City commercial banks (-), Size (+), Non-performing loans, Number of branches (-), Age of banks (-).
Chen and Wang (2015) China (DEA) 1994-2010	Commercial	EE	Size (+), Capital adequacy (+), Loan intensity (+/-), State ownership (-), GDP (+), Inflation (+/-).
Pessarossi and Weill (2015) China (SFA) 2004-2009	Commercial	CE	Capital ratio (+), large state-owned banks, City commercial banks, Joint-stock banks, Foreign banks, Size (+).
Wijesiri <i>et al.</i> (2015) Sri Lanka (DEA) 2010	Commercial	TE	Financial model: Age (+), Capital ratio (-), ROA, Institutional type. Social model: Age (-), Capital ratio, ROA (-), Institutional type (+).

Literature on determinants of Profitability in Banking

Studies (Profitability)	Banks	Variables of Financial Performance	Determinants of financial performance and its results
Petria <i>et al.</i> (2015) 27 EU countries 2004-2011	Commercial	ROAA ROAE	Size (+), Capital ratio (+), Credit risk = Impaired loans / Gross loans (-), Efficiency ratio (-), Liquidity risk = Loans / costumer deposits (-), Other operating income to assets ratio (+), Herfindhal-Hirschman Index (market concentration) (-), Inflation, GDP per capita growth (+).
Mamatzakakis <i>et al.</i> (2015) Japan 2000-2012	Commercial	ROA	- OLS: Capital ratio (+), Net interest margin (-), Nikkei index (+/-), Industrial production (+/-), Herfindahl–Hirschman Index (+), Quantitative easing (+/-), Z-score (+), Bankrupt loans (-), Restructured loans. - FEM: Capital ratio (+), Net interest margin (-), Nikkei index (+), Industrial production (+), Herfindahl–Hirschman Index (+), Quantitative easing (+), Z-score (+), Bankrupt loans (-), Restructured loans (-).
Chronopoulos <i>et al.</i> (2015) US 1984-2010	Commercial	ROA ROE	Size (+), Assets growth (+), Capital ratio (-), Net charge off over loans ratio (+), Loan intensity (-), Income diversification (-), Loan Herfindhal-Hirschman Index (-), GDP growth (+), Herfindhal-Hirschman Index (-), Tier 1 capital ratio (-), Total capital ratio (-), Bank competition (+).
Akhmedjonov and Izgi (2015) Turkey 2006-2009	Commercial	ROA	Capital ratio during crisis (+), Capital ratio out of crisis period (+), Liquidity ratio (+), Size, Private banks, Stateowned banks (+).
Alessandri and Nelson (2015) UK 1992-2009	Commercial	NIM	Lagged NIM (+), Leverage ratio (debts to assets ratio) (+), Total assets growth (-), GDP (+), Herfindahl index capturing sector concentration (-).
Brighi and Venturelli (2015) Italy 2006-2012	Commercial	ROA	Size (+), Capital adequacy, Loan loss provisions (-), Nonperforming loans (-), Financial crisis: 2008-2009 period (-), Sovereign crisis: 2010-2011 period (-).
Chavarín (2015) Mexico 2007-2011	Commercial	ROAA ROAE	Branches (+), Regulatory capital (+/-), Loans to deposits ratio (-), Market share (-), Family ownership, Foreign ownership.
Tan (2015) China 2003-2011	Commercial	ROA ROE NIM	Size (-), Liquidity (+), Taxation (-), Capitalisation (-), Stock market development (+), GDP (+), Inflation (+), Joint-stock banks (-), City commercial banks (-).
Terraza (2015) 1270 European banks 2005-2012	Commercial	ROAA	Large banks: Size, Capital ratio (+), Equity to loans ratio, Loan intensity, Ratio of liquid assets to deposits, loans to deposits ratio (-). Medium banks: Size, Capital ratio (+), Equity to loans ratio, Loan intensity, Ratio of liquid assets to deposits, loans to deposits ratio. Small banks: Size (-), Capital ratio (+), Equity to loans ratio (+), Loan intensity, Ratio of liquid assets to deposits, loans to deposits ratio.

Literature on determinants of risk management capability in Banking

Studies (Risk Management Capability)	Banks	Variables of Risk Management Capability	Determinants of Risk Management Capability and its results
Tabak <i>et al.</i> (2015) Brazil 2001-2011	Commercial	Z-score	Capital ratio (+), Market share (+/-), ROA, Size (+), Efficiency ratio.
Kohler (2015) 15 EU Countries 2002-2011	Cooperative, Savings, Commercial, Investment Banks -Banking corporation Securities houses	Z-score	Non-interest income share (+), Non-deposit funding share, Size (-), Capital ratio (+), Loan intensity (+), Net interest margin (+), Liquid assets to total Assets ratio, GDP growth (+), GDP per capita (+), Inflation (-), Deposit money bank assets to GDP (-), Concentration of market share of the three largest banks over total banking sector assets, Real long-term interest rate (-).
Zhang <i>et al.</i> (2015) USA 2003-2012	Bank holding companies	Z-score	House price index (+), Size (-), ROA, Short-term wholesale funding (-), Non-performing loan ratio (-), Loan loss reserve ratio (+), Institutional shareholding, Net interest income ratio (-).
Nguyen and Nghiem (2015) India 1990-2011	Commercial	Capital ratio	Public banks: Efficiency ratio (+/-), Loans to deposits ratio (+), GDP growth (-), Inflation (-). Private banks: Efficiency ratio (-), Loans to deposits ratio (+), GDP growth, Inflation (+).
Brighi and Venturelli (2015) Italy 2006-2012	Commercial	Z-score	Size (+), Capital adequacy (+), Loan loss provisions (-), Non-performing loans (-), Financial crisis: 2008-2009 period, Sovereign crisis: 2010-2011 period (-).
Carretta <i>et al.</i> (2015) 15 EU countries 1999-2011	Commercial	Z-score	Lagged z-score (+), Non-performing loans, Loan intensity, Size (-), Inefficiency ratio = operation expenses / operating income, Culture values, Market capitalisation (+), Domestic credit, GDP.
Horvath <i>et al.</i> (2014) Czech Republic 2000-2010	Commercial	Capital ratio	Non-performing loans (-), Credit risk (-), Z-score (+), Earnings volatility (-), Market share, Size (-), Unemployment (-), Inflation (+).
Chiamonte <i>et al.</i> (2015) 12 EU Countries 2001-2011	Commercial	Z-score	ROAA (-), Capital ratio (+/-), Impaired loans to gross loans ratio (+), Cost to income ratio, Liquidity ratio = loans to deposits ratio (+).
Saghi-Zedek and Tarazi (2015) 17 Western European countries 2002-2010	Commercial	Z-score	Size (-), Capital ratio (+), Deposits to assets ratio (+), Loan intensity (+), Net non-interest income (-), Efficiency ratio (-), GDP (+), Listed banks (-).
Bertay <i>et al.</i> (2013) 90 Countries 1991-2011	Islamic & Commercial	Z-score & Capital ratio	Z-score: Size, Liabilities over GDP, Equity (+), Short term debt (+), Investment banks (-), Inflation (+), GDP growth (+), GDP per capita. Capital ratio: Size (-), Liabilities over GDP (-), Short term debt, Investment banks (+), Inflation, GDP growth, GDP per capita.
Kick and Prieto (2015) Germany 94-2010	Commercial	Z-score	Capital ratio (+), Bank reserve, ROE (+), Non-performing loans (-), Off-balance sheet activity, GDP per capita growth, Local market share (-).

Appendix V

Definitions of key concepts

Sustainability Performance	Sustainability Performance is an integrative, holistic and long-term approach that advocates a balance between economic, social and ecological dimensions of business, making companies responsible not only for monetary, short-term goals but also for people and the planet” p.3 (Bedenik, 2015). G. W. Zheng, Siddik, Masukujjaman, & Fatema (2021) reviewed 227
Efficiency	Efficiency means achieving the maximum ratio between output and input during product development, necessitating the best resources distribution to achieve maximum potential (Alber et al., 2019).
Profitability	Profitability means the ability of the business to give a return on investment based on the resources used in comparison to an alternative investment. The profitability of banks measures the profitability of banks through return on asset (ROA) and return on equity (ROE) (Beck et al., 2013).
Risk Management Capabilities	Bank's risk management capability can also be termed as banks stability to withstand bankruptcy risks and heavy losses, to measure risk management capabilities by as Z-Score (Ghosh, 2014) Boyd, Graham, & Hewitt (1993), and Capital ratio, i.e., equity to total asset ratio (Horváth et al., 2014).

Technical Efficiency	According to (Alharthi, 2016), technical efficiency achieves efficiency by comparing potential and current production.
Pure Technical Efficiency	According to Majed Alharthi (2016) represents the performance of management efficiency measurement that transforms an input into output.
Scale Efficiency	Majed Alharthi (2016) states that is the ability of an organization to produce a big size output from a small size of the input. The banks achieve economies of scale by high-sized banking operations. Scale efficiency (SE)= constant returns on scale (CRS) / variable returns on scale (VRS)
Return on equity	is achieved by dividing net income with shareholders' equity (Guillén et al., 2014). $ROE = \text{Net Income} / \text{Total Equity}$
Net Interest Margin	NIM is the net interest margin to total assets earning. Higher NIM results in valuable investments and better interest revenue. Majed Alharthi (2016) $ROE = \text{Net Income} / \text{Total Equity}$
Z-score	Boyd et al. (1993) developed Z-score and measures statistically the probability of bankruptcy of banks and other organizations. The banks with better risk management capability have high Z-score

	and are less prone to bankruptcy. Altman Z-Score = $1.2A + 1.4B + 3.3C + 0.6D + 1.0E$ Where: A = working capital / total assets B = retained earnings / total assets C = earnings before interest and tax / total assets D = market value of equity / total liabilities E = sales / total assets
Capital Ratio	Formula shows the ratio of assets to liabilities, i.e. how many times a company can pay off its current liabilities with its current assets. The working capital ratio is Capital Ratio = Current Assets / Current Liabilities.
Gross Domestic Product (GDP)	Gross domestic product (GDP) is the standard measure of the value added created through the production of goods and services in a country during a certain period.
Inflation	Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country
Interest Rate	the interest rate is the amount you are charged for borrowing money, shown as a percentage of the total amount of the loan

exchange rate	An exchange rate is the value of one nation's currency versus the currency of another nation or economic zone
Bank size	size of banks means the bank having a total assets, gross volume of loans and clients deposits. This factor represents the bank's total assets.
Loan intensity	Loan intensity This ratio is calculated as loans over total assets.
Credit risks	credit risk is defined as ratio of loan to deposits of bank. credit risk= loan / deposits This ratio indicates the extent of risk of lending (using the deposits), whether high or low risk
Return on assets (ROA)	The ROA is a profitability ratio concerned with earnings which comes from using the total assets. ROA =net profit divided by total assets
Financial leverage	Financial leverage as total assets over total equity. This ratio finds the amount of financed assets by shareholders' equity.
Deposit ratio	Deposit ratio defined the deposit ratio as deposits over total assets. risk of accepting deposits from clients and how to invest the deposits compared to total assets
Financial leverage	Financial leverage is the use of debt to buy more assets. Leverage is employed to increase the return on equity.

Appendix VI

Status of Bank branches All over the Country

Bank name	Total Branches	Open Branches	Closed Branches		
ABL	1417	1361	96.05%	56	3.95%
Askari Bank	548	518	94.53%	30	5.47%
Bank Al-Habib Ltd.	754	754	100.00%	0	0.00%
Bank Alfalah	693	613	88.46%	80	11.54%
Bank Islami	340	309	90.88%	31	9.12%
FWBL	42	36	85.71%	6	14.29%
Dubai Islamic	252	247	98.02%	5	1.98%
HBL	1750	1545	88.29%	205	11.71%
Habib metro	401	389	97.01%	12	2.99%
JS Bank	365	362	99.18%	3	0.82%
MCB	1418	1268	89.42%	150	10.58%
MCB Islamic	185	183	98.92%	2	1.08%
Meezan	760	755	99.34%	5	0.66%
Samba	40	39	97.50%	1	2.50%
Silk Bank	124	119	95.97%	5	4.03%
Sindh Bank	335	331	98.81%	4	1.19%

Soneri Bank Ltd.	310	288	92.90%	22	7.10%
Standard Chartered	61	60	98.36%	1	1.64%
Summit Bank	193	167	86.53%	26	13.47%
BOK	176	171	97.16%	5	2.84%
UBL	1415	1400	98.94%	15	1.06%
BOP	790	780	98.73%	10	1.27%
Faysal Bank	556	551	99.10%	5	0.90%
NBP	1589	1574	99.06%	15	0.94%
Bank of China	1	1	100.00%	0	0.00%
ICBC	3	3	100.00%	0	0.00%
Citi Bank	3	3	100.00%	0	0.00%
SME Bank	13	13	100.00%	0	0.00%
Al-Baraka Bank	194	194	100.00%	0	0.00%
PPCBL	151	151	100.00%	0	0.00%
Deutsche	2	2	100.00%	0	0.00%
IDBL	2	2	100.00%	0	0.00%
ZTBL	502	501	99.80%	1	0.20%
Total	15385	14690	95.48%	695	4.52%

Microfinance Banks					
FINCA	132	129	97.73%	3	2.27%
U micro finanace	202	202	100.00%	0	0.00%
Pak Oman	30	30	100.00%	0	0.00%
NRSP	154	153	99.35%	1	0.65%
Telenor MFB	171	171	100.00%	0	0.00%
APNA MFB	116	113	97.41%	3	2.59%
Advans MFB	13	11	84.62%	2	15.38%
Mobilink	74	72	97.30%	2	2.70%
SindhMFB	17	17	100.00%	0	0.00%
Khushhali Bank	213	211	99.06%	2	0.94%
First MFB	199	199	100.00%	0	0.00%
Total	1321	1308	99.02%	13	0.98%

Appendix VII

Table Sector Wise Financing 2020

Sectors 2020	Sector Wise Financing (Figures in PKR bln)	NPLs	Infection (%)	Share in total Advances
Energy	1,394	58	4%	15%
Textile	1,343	170	13%	15%
Individuals	815	65	8%	9%
Agribusiness	702	80	11%	8%
Pharma & Chemicals	327	17	5%	4%
Sugar	238	57	24%	3%
Financial Sector	230	11	5%	3%
Cement	204	6	3%	2%
Automobile	143	18	12%	2%
Electronics	111	22	20%	1%
Shoes & Leather garments	37	6	15%	0%
Insurance	6	0	2%	0%
Others	3,473	319	9%	38%
Total	9,024	829	100%	100%