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The Sri Lankan Journal of Banking and Finance (SLJBF) is a referred Journal bi-annually published research papers and scholarly work by the Department of Banking and Finance, Wayamba University of Sri Lanka. The main objective of the SLJBF is to publish scientific research findings that address issues and developments related to economics in general and money, banking, financial markets in particular at both national and international level. All research articles submitted are double blind reviewed prior to publishing. Views expressed in the research articles are not the views of the Department of Banking and Finance, Wayamba University of Sri Lanka or the Editorial Board.

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Editorial Preface

We are pleased to present Volume 7(2) of the Sri Lankan Journal of Banking and Finance (SLJBF), a refereed journal of Banking and Finance published by the Department of Banking and Finance, Wayamba University of Sri Lanka. SLJBF provides a unique platform for researchers, academicians, professionals, and research students to impart and share knowledge in the form of high-quality research papers to infuse innovative systems and methods to the economy and finance as a whole. In line with that SLJBF invites you to join with us by writing quality manuscripts in the discipline of economics, banking and finance.

We received a good response for the call for papers and out of the paper received five papers selected for the publication through the rigorous blind review process. We wish to thank all the authors who contributed to this issue by submitting their novel research findings. The volume 7(2) of SLJBF deals with timely important topics, Assessing the Dynamic Linkage Between Exchange Rates and Stock Prices: Evidence from SAARC Countries, Factors Influencing Occupational Stress; with Special Reference to the Staff of the Public Sector Banks in Hambanthota District, The Impact of Liquidity Risk on the Financial Performance of Licensed Commercial Banks in Sri Lanka, Impact of Risk Management on the Profitability of Licensed Commercial Banks in Sri Lanka and a Comparative Study on Customer Experience in Digital Banking and Physical Banking in Sri Lanka: A Special Reference to Sri Lankan Commercial Banks. Thus, the journal has widened its scope to appeal to a wider readership with varied interest and needs.

On this occasion, I would like to extend my sincere thanks to the dedicated panel of distinguished reviewers, members of the editorial advisory board, members of the editorial board and the assistant editors for their unstinting and voluntary contribution to make this issue a success. The continued support of the governing body of the Wayamba University of Sri Lanka in this endeavor is also acknowledged.

Prof. D.A. T. Kumari
Editor in Chief
Sri Lankan Journal of Banking and Finance
Department of Banking and Finance, Wayamba University of Sri Lanka

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Aims and Scope

The Sri Lankan Journal of Banking and Finance (SLJBF) is a refereed Journal bi-annually published research papers and scholarly work by the Department of Banking and Finance, Wayamba University of Sri Lanka. Sri Lankan Journal of Banking and Finance (SLJBF) publishes theoretical and empirical papers spanning all the major research fields in economics, banking and finance The aim of the SLJBF is to bringing the gap existing in the theory and practice of Economics, Banking and Finance by encouraging researchers, academicians, professionals, and research students to impart and share knowledge in the form of high quality research papers to infuse innovative system and methods to the economic and financial system as a whole. Thus, the journal's emphasis is on theoretical and empirical developments and policy-oriented research in economics, banking and finance.

Core Principles

- Publication in the journal of banking and finance is based upon the editorial criteria cited and the evaluation of the reviewers (each manuscript will be sent two reviewers);
- Priority is given for novelty, originality, and to the extent of contribution that would make to the particular field.
- Conceptual papers based upon current theory and empirical findings and contribute to the development of theory in the domain of Banking and Economics are also welcome.

The journal welcomes and publishes original articles, literature review articles and perspectives and book reviews describing original research in the fields of economics, banking and finance. The core focus areas of the journal include;

- Financial Intermediation
- Bank Solvency and Capital Structure
- Banking Efficiency
- Bank Failure and Financial crisis
- Behavioral Finance
- Corporate Finance
- Corporate Governance and Ethics
- Credit Rating

- Derivative Pricing and Hedging
- Financial Economics and Mathematics
- Financial Engineering
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FACTORS INFLUENCING OCCUPATIONAL STRESS; WITH SPECIAL REFERENCE TO THE STAFF OF THE PUBLIC SECTOR BANKS IN HAMBANTHOTA DISTRICT

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Abstract

The Sri Lankan banking sector after liberalization has operated in a relatively stable environment. The banking system has proven beneficial to both the world and Sri Lankan economies. This research investigates the influencing factors on occupational stress of staff of the public banks in the Hambantota District. The research was conducted through Physical environment, Workload, Role ambiguity and interpersonal Strain that mainly affect stress.

This study adopted a quantitative research approach. Using survey questionnaire responses, a sample of 216 managerial and non-managerial employees in the Hambantota District selected using a convenience sampling technique. To test the hypothesized impact on variables, the multiple regression analysis was performed using the SPSS 23.0 version.

According to the regression analysis, Workload and Role ambiguity have a significantly positive impact on occupational stress. Physical Environment significantly negatively impact occupational stress and interpersonal Strain do not impact occupational stress. The study's findings will be useful for industrial experts, Managers and Policymakers to identify Stress levels and improve strategies to reduce stress and Improve employee performance. Also, these research findings would develop new knowledge about suggestions for reducing Occupational Stress.

Keywords: Banking Sector, Interpersonal Strain, Occupational Stress, Physical Environment, Role Ambiguity, Workload

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1. INTRODUCTION

1.1. Background of Study

Globalization, liberalization, and other worldwide developments in the 21st century brought about significant changes in the banking industry in Sri Lanka (Maduwanthi, 2021). According to the Central Bank Report, 2021, the financial and banking services sector improved by 7.5% in 2021 compared to 10.9% in 2020, considering the Sri Lankan economy and banking system. The banking sector has 31.4 billion dollars in assets. 27 billion dollars in 2021 and 23 billion dollars in 2022 were the total assets managed by the banking industry. It can be identified that mainly operate as licensed specialized and licensed commercial banks in Sri Lanka (World Finance, 2022). Bank of Ceylon, Peoples Bank, National Savings Bank, Lanka Putra Bank, Regional Development Bank, and State Mortgage and Investment Bank are public sector banks and financial institutions that provide grants to the economy (Central Bank, 2022) The staff turnover rate is low compared to other sectors, but the ratio was 24% in 2019 and the turnover rate was 26% in 2021 in the banking and financial sector (Zippia the Career Expert, 2023). According to Ufer (2023), the Banking and finance sector has an 18.6% turnover rate, according to a Comp data survey. Job satisfaction, college connections, communication, organizational dedication, justice, organization politics and reputation all have an impact on employee turnover in the financial sector and employee stress is a factor that is present in all the categories. A minimum population of 676,000 lives in the Hambantota district in the southern province with a population of 22,156,000 (City Population, 2022). According to (Department of Census and Statistics, 2022) the contribution of Hambantota district to the service sector is 43.8% and it has recorded the highest value when compared to the districts of Galle (43.3%) and Matara (43.0%) in the southern province. The contribution to GDP in the financial and banking sector of the Southern province is 9.9% (Central Bank Report, 2021).

The banking system has proven beneficial to both the world and Sri Lankan economies. The banking industry has seen a rise in employee turnover despite high wages. Employees of public sector banks in Hambantota District, which has the least development and the lowest population level, were the basis for these investigations. A significant gap can be identified when compared with previous studies. Accordingly, this study discusses Physical environment, Workload, Role ambiguity and interpersonal Strain related to stress.

1.2 Research Problem

Stress can negatively be impacted on an employee's work performance in different ways. As a result of that high employee turnover, absenteeism, grievances, and job dissatisfaction can be seen at the workplace. Therefore, stress has grown into a situation that requires immediate attention. The banking sector is an important part of the Sri Lankan economy (Prabaharan & Panchanatham, 2016). According to Azad & Tilottama stated that main stressful factors in the banking sector including high workload, ineffective compensation packages, lack of job autonomy, organizational

culture, role conflict and a lack of supervisor support. Perceived stress can impact every individual in several aspects such as emotions, behavior, thinking and health (Deva, 2022). Stress reduces employee productivity, puts more pressure on managers and causes management decisions to take longer. Therefore, organizational stress can be identified as a common occurrence in banking (Siyambalapitiya & Sachitra, 2019).

According to literature, the banking industry experiences high rates of stress owing to frequent changes in work, workload, client service, contributions, rapid technology change, and a lack of consumer responsiveness (Renukamurthy & Manjunatha, 2017). According to previous research, attention has been focused only on the job and organizational factors affecting occupational stress and measuring the relationship among occupational stress and factors. But in conducting this study, in addition to Physical environment, Workload, Role ambiguity and interpersonal Strain are also considered and the factors influencing occupational stress of public banks in Hambantota district are considered.

According to practical scenario, in comparison to other districts, the southern province exhibits the greatest value at 43.7%, and 47.0% of the service population in Sri Lanka has contributed to the service industry. according to the country's economy. It can be numerically stated as 41.4% (Department of Census and Statistics, 2022). According to the Bank Compensation and Benefits Survey 2022, non-officer turnover is on the rise despite attractive compensation and benefits. According to the Human Resources data in 2022, the turnover rate of Hambantota district is 6.9%, which is the highest among all districts (Human Resources, 2022). The customer base of public sector banks in rural areas is high. The reason is that customers are highly inclined to transact with public sector banks due to convenience, trust, and vigilance. According to the study, however, more customers can be identified for public sector banks in rural areas compared to urban banks. This has been influenced by customer confidence in public sector banks than in the private sector (Wanninayake & Dissanayake, 2012). Based on the information of the employees of the public banks in the Hambantota district, a preliminary analysis was done to practically identify employee stress. According to the responses of 42 employees, it was confirmed that there is a level of stress of 66.7**%**.

Therefore, the problem statement of this research is what are the factors that influence the occupational stress of staff of the public sector banks in Hambantota District?

1.3 Research Objectives

Here the researchers wish to achieve the following objectives through the end of this research.

I. To examine the impact of organizational factors on occupational stress.
II. To determine the impact of job factors on occupational stress.
III. To study the impact of environmental factors on occupational stress.
IV. To ascertain the impact of interpersonal factors on occupational stress.

This study helps to determine the workplace stress of public bank employees working in the Hambantota district as well as the level of stress in the public banking system. In addition, this study is also important for developing knowledge about factors that affect the stress of the public bank system. This helps to identify the factors affecting job performance in the organization so that employers can implement strategies to create a healing and more supportive work environment. This increases job satisfaction and overall well-being among employees. Occupational safety and risk management also help. Occupational Stress support to identify the impact of productivity and develop strategies to mitigate their effects, and reducing stress levels can contribute to the overall success of the organization. Turnover and healthcare costs are higher. Investing in stress-reduction programs will be made more informed by this study, which will also assist quantify the financial burden of stress-related issues. This helps save costs in the long run. Furthermore, understanding occupational stress can help organizations and policymakers prioritize employee well-being. It is important to manage.

2. LITERATURE REVIEW

Previous research has shown that the banking industry experiences high rates of stress owing to frequent changes in work, workload, client service, contributions, rapid technology change, and a lack of consumer responsiveness (Renukamurthy & Manjunatha, 2017). When banks restructure, they increase the workload on their employees, which causes employee churn, alterations in employee behavior, and changes in employee attitudes. According to (Prabaharan & Panchanatham, 2016) occupational stress contributes to decreased quality, productivity and health, well-being, and morale in the public banking sector are changes in professional duties. It explains occupational roles only impact occupational stress. According to previous research, attention has been focused only on the job and organizational factors affecting occupational stress and measuring the relationship among Occupational stress and Factors. But in conducting this study, in addition to job and organizational factors, environmental factors and interpersonal factors are also considered, and the Factors influencing Occupational Stress of public banks in Hambantota district are considered.

2.1 Occupational Stress

Occupational stress has become a widespread concept worldwide in the 21st century (Ramamoorthy & Mohan, 2018). It identifies as "Job stress, workplace stress, and organizational role stress" (Akhi, 2020). It is the condition that people experience when they are presented with demands and pressures that challenge their knowledge, skills, and ability to cope (Siyambalapitiya & Sachitra, 2019). Occupational stress is linked with job responsibilities and individual responses about employment, their knowledge and skills are challenged by pressures that do not match their ability to cope (Kula, 2017). Employees in the banking industry have experienced a wide range of stressful scenarios compared to those in other industries (Ramamoorthy & Mohan, 2018). The effects of stress on a person's behavior, cognition, and overall well-being are all observed. Stress symptoms are broken down into emotional, physical, cognitive, and behavioral categories (Yadav, 2017).

2.2 Factors Influencing Occupational Stress

A variety of factors that influence occupational stress, including gender, job experience and banking and finance regulations (Giorgi, et al., 2017). Increased working hours, role conflicts and political influence have led to increased occupational stress among private and public sector bank employees (Deshwal, 2015). Employees in banks face stress due to limited vacation time, variety of occupations, discriminatory responsibilities, increased workloads and organizational conflict situations (Ahammad, Lee, Malul, & Shoham, 2015). Heavy workload, long work hours, lack of resources and managerial support, lack of authority, a staff shortage, a less effective performance management approach, a lack of appropriate motivation and stringent organizational culture and policies were main causes of stress (Yadav, 2017). According to above literature can identify selected Independent variables impact to Occupational stress, so use that factors.

2.2.1 Workload

Organizational factors interact with personal traits and environmental variables to affect stress at work (Shukla & Garg, 2013). The main factors can be identified as wage discrimination, complex organizational structures, stringent laws and regulations in the corporate system, ineffective communication, conflicts over divergent organizational and employee goals and a lack of employee involvement in decision-making and management of employees under strict rules (Elahi & Apoorva, 2012). Concerns about job security or heavy workload demands increase the stress level of individuals and lead to various emotional and physical ailments (Siyambalapitiya & Sachitra, 2019).

Workload is a situation brought on by the accumulation of additional tasks inside an organization to achieve the goals of numerous positions for the satisfaction of oneself or others (Shen & Slater, 2021). The level of performance of employees is high due to insufficient staff for tasks with tight deadlines, agents dealing with heavy workloads, and staff turnover rate (Jayasinghe & Mendis, 2017).

Work overload has been linked to elevated levels of stress, according to many researchers (Roslan, 2011). Because of the excessive workload and shortage of qualified personnel, job stress is to be expected (Akhi, 2020). The following hypothesis (H1) was developed to measure the impact of workload on occupational stress.

H1: There is an impact of workload on occupational stress

2.2.2 Role Ambiguity

This stress is influenced by the nature of the task, unpleasant and dangerous working circumstances, a lack of security and crowded workspaces (Shukla & Vaishnav, 2013). Role ambiguity is another aspect of occupational stress. This leads to the unpredictability of performance when the employee does not have the necessary information (bawa2012). Role ambiguity is characterized by defined, hazy, and vague

rules for a certain position (Ahammad, Lee, Malul, & Shoham, 2015). It implies that a lack of knowledge or awareness may result in uncertainty regarding the role's duties (Prabaharan & Panchanatham, 2016). The behaviors that are most strongly associated with psychological job stress are role-playing, anxiety and impatience (Maduwanthi, 2021).

The following hypothesis (H2) was developed to measure the impact of role ambiguity on occupational stress.

H2: There is an impact of Role ambiguity on Occupational stress

2.2.3 Physical Environment

The larger external environment in which the company functions when analyzing its effects on stress at work. Stress is mostly influenced by the organization's communication style, cooperation, and collaborative work culture (Areekkuzhiyil, 2014). According to earlier research there is no social environment, support, or assistance. An organization's culture affects how its personnel behave in a certain situation (Alghamdi, 2018)**.** Stress can be caused by factors including high temperatures, noise levels, poorly designed and unpleasant workplaces, lighting, cleanliness, and organizational structure (Hong et al., 2013). Environmental factors such as weather, noise, pollution, traffic, and unsafe environment influence stress (Eshan & Ali, 2019).

The following hypothesis (H3) was developed to measure the impact of physical environment on occupational stress.

H3: There is an impact of physical environment on occupational stress.

2.2.4 Interpersonal Strains

The interpersonal relationship has been greatly influenced by stress at work. Personality qualities, coping methods, and work-life balance are examples of individual factors (Bakker & Demerouti, 2017). To improve performance and organizational effectiveness, collaboration and teamwork are necessary (Eduardo Salas et al., 2014). Previous studies have shown that work family conflict is a great antecedent to workplace stress. The degree of interpersonal ties is gauged by interpersonal stress (Roslan, 2011). Many academics contend that connections with coworkers and job satisfaction are significantly correlated (Sinha & Shukla, 2013). It has been shown that a bad working relationship between the supervisor and staff might lead to tension in the workforce (Roslan, 2011). Additionally, it includes employee loyalty and collaboration in the workplace (Ali et al., 2015).

According to (Muhammad & Kishwar, 2019) Interpersonal relationships may be negatively impacted by occupational stress resulting from contradictory or unclear job duties. It is noteworthy that there might be a complicated and multidirectional interaction between interpersonal stress and work stress. The following hypothesis

(H4) was developed to measure the impact of interpersonal Strain on occupational stress.

H4: There is an impact of interpersonal strain on occupational stress.

2.3 Research Framework

This study lends support to understanding the psychosocial realities of the workplace and helps identify features of work and related occupations in explaining health and safety concerns. Based on an empirical study, the characteristics of work and how it is experienced are outlined. The study also points out the activities that cause problems, how the problems are managed, and the reason for the approach used. There are four independent variables for these studies which consist of workload, Role ambiguity, Physical Environment and Interpersonal Strains under organizational factors, environmental factors, interpersonal factors, job factors and one dependent variable which is occupational stress. The research framework of this study is as below. The conceptual framework can also be seen in the following diagram.

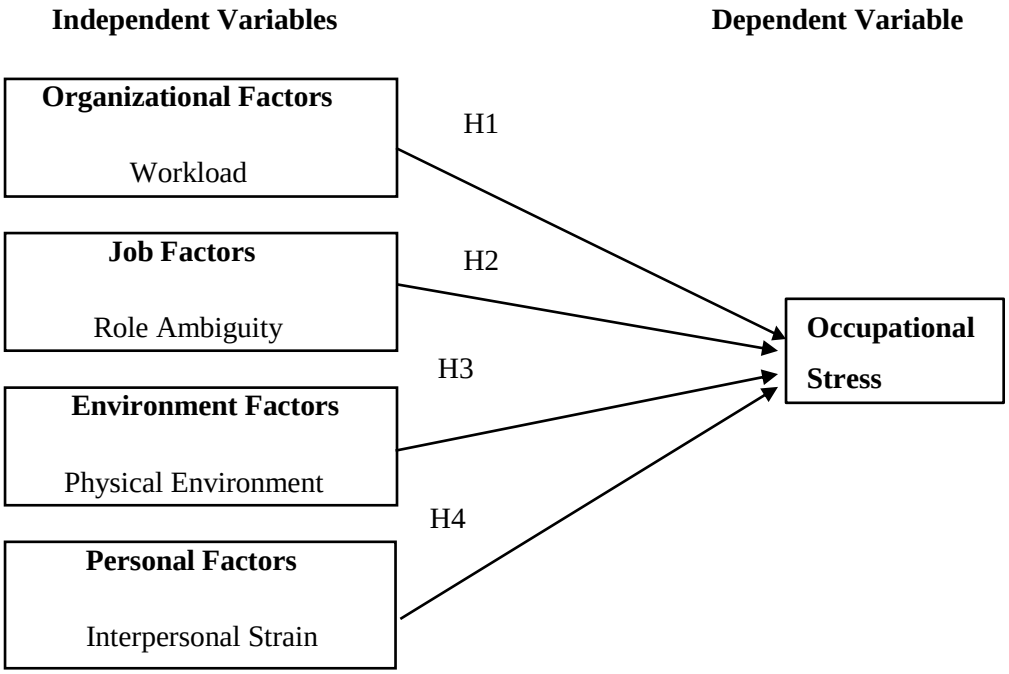

Figure 1: Conceptual Framework

3. RESEARCH METHODOLOGY

The impact of workload, Role ambiguity, Physical Environment and Interpersonal Strains (independent variables) on occupational stress (dependent variable) has been attempted to be explained. The population of this study consists of 439 managerial and non-managerial employees working in five public sector banks (Bank of Ceylon, People's Bank, Regional Development Bank, HDFC Bank, and National Savings Bank) in the Hambantota District. The sample of 216 represents all the employees of the public sector banks in Hambantota District. The convenience sampling method has been used to select the sample of the study. Following table 1 explain the population and Sample size of the study.

Table 1: Selecting the Sample

Bank	Branches	Gender		Position		Total
		Female	Male	Manager	Non-Manager	
RDB	14	91	10	1	100	101
Peoples Bank	11	54	33	1	86	87
BOC	12	111	13	1	123	124
HDFC Bank	01	6	4	1	9	10
NSB	13	83	34	1	116	117

Source: Developed by the Researcher, 2023

The quantitative Approach was used for this research and deductive methodology was its research strategy. This study's goal is to ascertain how the elements taken into consideration affect the stress of the staff of Hambantota District's public sector banks. Both primary and secondary data are used for this study. The questionnaire method was used to collect primary data. Secondary data was collected through previous research studies, articles, journals, books, websites, reports, and the contents published online. The questionnaire consists of demographic information, dependent variables and independent variables of the study. A five-point Likert scale was used for all sections ranging from 1 (strongly disagree) to 5 (strongly agree).

The relation between workplace stress and organizational factors, job factors, environmental factors, and interpersonal factors are investigated using multiple linear regression analysis. The SPSS software package was used to analyze the data. Conducted Pilot study through 25 respondents. The data from pilot research was tested using Cronbach's Alpha (Coefficient).
When alpha is ≥ 0.7 the question is constantly reliable (Cronbach's Alpha).

Table 2: Reliability of Pilot Test

Variable	Number of Item	Cronbach's Alpha
Occupational Stress (DV)	6	.943
Physical Environment (IV)	5	.946
Interpersonal Strains (IV)	5	.787
Role Ambiguity (IV)	5	.961
Workload (IV)	5	.909

Source: Survey Data, 2023

4. ANALYSIS AND DISCUSSION

The degree of correlation and strength of relationship between independent and dependent variables are described by Pearson Product Moment Correlation Analysis. According to the table;

Table 3: Results of Pearson Correlation Analysis

		Occupational Stress
Physical Environmental (PE)	Pearson Correlation	-.423
Interpersonal Strains (IS)	Pearson Correlation	.202
Role Ambiguity (RA)	Pearson Correlation	.391
Workload (W)	Pearson Correlation	.345

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Source: Survey Data, 2023

There is a small correlation between Interpersonal Strains and occupational stress and the correlation value is 0.202. There is a medium correlation between Role ambiguity and occupational stress as well as workload and occupational stress. Values are as 0.391 and 0.345. The correlation coefficient between Physical Environment and occupational stress (r = -0.423) showed that there is a negative relationship between these two variables. The correlation coefficient for Interpersonal Strains and occupational stress (r = 0.202) revealed that there is a moderate positive relationship between those two variables. The correlation coefficient between Role ambiguity and occupational stress (r = 0.391) showed that there is a positive relationship between these two variables. The correlation coefficient between workload and occupational stress (r = 0.345) showed that there is a positive relationship between these two variables.

The impact of contributing stress factors on occupational stress is assessed using the multiple regression analysis. The impact between independent and dependent variables can be found by the researcher using multiple regression. It is used to analyze how factors (Role ambiguity, workload, physical environment and interpersonal Strains (independent variable) affect occupational stress (dependent variable). The R-squared value is the measure that measures the strength of the independent variable to measure the dependent variable. R square value is 0.26 or greater value represents a high impact (Almeida & Perera, 2015). According to Table 4, R squared equals 0.292 (29.2%). That is, independent variables have a high level of influence on dependent variables. The researcher uses the P-value to test the significance of the variables under consideration. According to Table 5, this model is significant under a 5% level of significance.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std.Error of the Estimate	Durbin - Watson
1	.540[a]	.292	.278	.24591	1.616

Table 5: ANOVA Table

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.114	4	1.279	21.142	.000[b]
Residual	12.397	205	.060		
Total	17.511	209			

a. Dependent Variable: OSMean

b. Predictors: (Constant), WMean, ISMean, PEMean, RAMean

According to Table 6, Physical Environment beta coefficient value is -.316, indicating that when the Physical Environment is increased by one unit, the Occupational Stress by -.316 units (31.6%). This factor has a significant value of 0.000. That is, the significant value is less than 0.05, indicating that the factor is statistically significant in the study. The Interpersonal Factor beta coefficient value is .072, indicating that when the Physical Environment is increased by one unit, the Occupational Stress by .072 units (7.2%). This factor has a significant value of 0.237. That is, the significant value is more than 0.05, indicating that the factor is statistically insignificant in the study. The Role Ambiguity beta coefficient value is .220, indicating that when Role

Ambiguity is increased by one unit, the Occupational Stress by 220 units (22.0%). This factor has a significant value of 0.001. That is, the significant value is less than 0.05, indicating that the factor is statistically significant in the study. The Workload beta coefficient value is .168, indicating that when the Workload is increased by one unit, the Occupational Stress by .168 units (16.8%). This factor has a significant value of 0.011. That is, the significant value is less than 0.05, indicating that the factor is statistically significant in the study.

This study used the regression analysis method to test the hypothesis.

H1: There is an impact of Workload on Occupational Stress.

According to the regression analysis, the P-value and beta values are 0.011 and .168 respectively. Considering the p-value (0.011), it is less than 0.05. Therefore, the alternative hypothesis is accepted. Accordingly, there is a Significant Positive impact of Workload on
Occupational Stress (see Table 7)

H2: There is an impact of Role Ambiguity on Occupational Stress.

According to the regression analysis, the P-value and beta values are 0.001 and .220 respectively. Considering the p-value (0.001), it is less than 0.05. Therefore, the alternative hypothesis is accepted. Accordingly, there is a Significant Positive impact of Role Ambiguity on Occupational Stress (see Table 7)

H3: There is an impact of Environmental Factors on Occupational Stress.

According to the regression analysis, the P-value and beta values are 0.000 and -.316 respectively. Considering the p-value (0.000), it is less than 0.05. Therefore, the alternative hypothesis is accepted. Accordingly, there is a significant negative impact of Physical Environment on Occupational Stress (see Table 7).

H4: There is an impact of the Interpersonal Strains on Occupational Stress.

According to the regression analysis, the P-value and beta values are 0.237 and .072 respectively. Considering the p-value (0.237), it is more than 0.05. Therefore, the alternative hypothesis is Rejected. Accordingly, there isn't an impact of the Interpersonal Strains on Occupational Stress (see Table 7).

Table 6: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.787	.414		6.731	.000
PEMean	-.293	.057	-.316	-5.118	.000
ISMean	.069	.058	.072	1.185	.237
RAMean	.229	.069	.220	3.312	.001
WMean	.177	.069	.168	2.552	.011

Dependent Variable: OSMean

Table 7: Hypothesis Testing

Hypothesis	P-Value	Beta Value	Accepted/Rejected
H1 – WMean	0.011	.168	Accepted
H2 – RAMean	0.001	.220	Accepted
H3 - PEMean	0.000	-.316	Accepted
H4- ISMean	0.237	.072	Rejected

Source: Survey Data,2023

5. CONCLUSION

The primary purpose of this research was to study the effect of factors on occupational stress. In this research it was revealed that Workload and Role Ambiguity have a positive impact on occupational stress. However, according to this study, it was found that physical environment has a negative effect on occupational stress. Moreover, interpersonal factors do not have any effect on occupational stress. According to hypotheses of the study, occupational stress is available in the public sector banks of Hambantota District. It can be concluded that Role Ambiguity has a high level of impact on occupational stress. To reduce occupational stress, it can be concluded that there should be an intervention regarding organizational as well as job.

According to the findings, there is a positive relationship between occupational stress and job factors as well as organizational factors of public sector banks in Hambantota District. The stress in the public sector banks is primarily influenced by role ambiguity and in addition to workload by reducing role and role ambiguity in the banking sector. Providing employees with a broad understanding of job responsibilities and expectations of the organization, assigning employees a specific

amount of duties and those duties automatically preparing a proper time frame, implementing training programs related to new technology techniques and automation, properly allocating human, financial and physical resources needed to facilitate the work of employees, in addition organize employee wellbeing timely health programs, mental health awareness programs, stress management programs, organizing support programs such as monthly employee meetings and outings can reduce occupational stress among employees.

According to the literature survey it was revealed that no previous studies have been conducted focusing on the factors affecting occupational stress of the staff of the public sector banks in Hambantota District. Further, some future studies can be conducted to minimize the gap between theoretical and practical knowledge. Conducting studies focusing on emotional intelligence, role perception, and demographic factors. Moreover, only the main factor affecting the stress identified in previous studies was used as the sub-factors of the independent variables used for this study. Because of that, additional factors can be used for future studies. In this study, only closed- 33-ended questions were included in the questionnaire for this study. However, future research can include open-ended questions as well. It enables respondents to express themselves correctly. Also, public sector and private sector banks focus on the Hambantota District. Accordingly, comparative study can be done between joining occupational stress management programs to enhance their effectiveness and future research may replicate this study or conduct similar studies using it.

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ASSESSING THE DYNAMIC LINKAGE BETWEEN EXCHANGE RATES AND STOCK PRICES: EVIDENCE FROM SAARC COUNTRIES

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Abstract

This study examines the dynamic relationship between exchange rate and the stock market price, using the evidence from four South Asian countries where the research gap has prevailed from a lesser number of studies and research has made little to no attempt in investigating the predicting power of the stock price using the exchange rate. By conducting time series analysis on the dynamic relationship between the exchange rate and the stock price in Sri Lanka, India, Pakistan and Bangladesh it was found that the variables are stationary at first difference. The insignificance of Johanson cointegration test results revealed that there is no long-term relationship between the variables in each country. Using the VAR estimates, the impulse response and variance decomposition has been tested to discover how each variable absorbs the shocks from the other variable. Granger causality test has shown that both Sri Lanka and India recorded bidirectional granger causal relationship, Pakistan showed unidirectional relationship whilst Bangladesh showed no causal relationship between the variables. Finally, the machine learning model revealed that the exchange rate can predict the stock price at 70.19% accuracy. Thereby, results of this study support that exchange rate and stock price in South Asian countries have a short-term significant relationship. Implication of this study could be used by the managers, policy makers and enterprises in diversifying the portfolios and obtaining maximum advantages from currency depreciation. However, this study also makes pre warning that if the direction has been changed due to the higher volatility of this relationship currency depreciation would bring negative implications on the stock prices. Therefore, policy makers should not solely depend on the exchange rate in making decisions. Further, as this study only covers the short-term impact, future studies are encouraged to assess the long-term relationship considering multiple aspects such as different exchange rates, other macroeconomic variables etc. to provide greater insights.

Keywords: Stock Market, Exchange Rate, Cointegration, Granger Causality, Machine Learning

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1. INTRODUCTION

1.1. Background of the Study

The financial architecture of developing economies has changed dramatically as a result of globalization and banking sector reforms. In the avant-garde timeline, the activities in financial markets play a salient role in the economy and vice versa. In recent years, countries have used currency rates more liberally for the betterment of their economies). In the meanwhile, the goal of exchange rate interventions in developing nations is to establish a stable exchange rate regime. (Delechat, 2024; Ouyang et al., 2016). In the financial press, there is a widespread belief that stock prices and currency rates are inextricably linked which is considered to be a dynamic relationship.

Interestingly enough, referring to the theoretical aspect of this relationship, according to the standard macroeconomic theory, it was mentioned that changes in exchange rates have an impact on multinational companies' competitiveness, as well as their earnings and stock prices (Dornbusch & Fischer, 1980). A devaluation of the local currency lowers the cost of exporting goods, potentially increasing overseas demand and sales. In sequence, a depreciation of the local currency would increase the worth of an exporting company. When the local currency appreciates, however, foreign demand for an exporting firm's products decreases, and the firm's profit and stock price fall. On the other hand, appreciation of the currency will have negative impact on the exporting goods hence, profit falls. Further, exchange rate variations may have an impact on stock prices because they create equity flows. The other side of the coin could be depicted as, exchange rate swings can be influenced by stock price fluctuations. When a thriving stock market attracts capital from international investors, raising demand for a country's currency and vice versa. As a result, rising (falling) stock values are linked to exchange rate appreciation (depreciation). According to Gavin (1989), investors' wealth and money demand may be influenced by stock market performance, stock price swings may have an impact on exchange rates.

In order to define the dynamic relationship between the financial markets and the exchange rates many researchers have made an effort in different perspectives. Which avowed it as a dynamic relationship where the between the financial market and FOREX has depicted different results in different markets. Some studies have found a negative relationship between exchange rates and stock prices, while others have found a positive relationship and still others have found an insignificant interaction between the two factors (Lee et al., 2011; Arwade, 2019; Dash & Sahu, 2018; Kassouri & Altıntaş, 2019). Overall, the results have proven contentious. Further, regardless of the country, region and their development status the relationship between the stock market and FOREX has shown multifarious results. This has been depicted vividly especially in emerging and developing economies, where it shows different relationships which show far more different than previously perceived results from developed countries. As a result, emerging and developing markets tend to be unrelated to one another and to developed markets. (Bello, Zakri, 2013)

Hence, identifying the linkage between the stock market and FOREX in said economies has played a key aspect. Even though the theoretical aspect provides a sound base on the relationship between the stock market and the FOREX rates, Results in the researchers has depicted otherwise. Therefore, looking at this dynamic relationship with a holistic view could be considered as much important with the current globalized market perception.

Moreover, this research selects South Asia's major intergovernmental organization and geopolitical union, South Asian Association for Regional Cooperation (SAARC) countries, i.e., Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. which was established in 1985 with the purpose of "promote economic growth, social progress and cultural development within the South Asia region" Having diversified culture, business etiquette and due to combination of economy structures SAARC which providing a best approach for this study.

1.2. Research Problem

Many researches have been done in proving different aspects of the relationship between the stock indices and exchange rates. Most of these research' empirical evidence has been inconsistent and ambiguous. This is due to the fact that the relationship between stock prices and exchange rates is studied in a bivariate or multivariate framework using various econometric methods for different time periods, different data frequencies (daily, monthly, and quarterly), different stock price and exchange rate measures (nominal or real), and for different economies (developed, emerging and developing). Therefore, this demands more regional and country specific studies to confirm what sort of a relationship is there between the exchange rate and stock prices.

Further, in spite of many research done with regard to this topic, Research gaps have been identified where researchers have paid little attention to SAARC countries where the empirical researches have been done half decade ago. Being an important regional association consisting of countries included in various emerging economies and political conditions i.e., emerging countries (India) and developing countries Sri Lanka, Pakistan, Bangladesh which belong to lower middle- income level, this research is expected to provide an extensive analysis. Moreover, apart from the traditional analytical methods, the machine learning model is built to confirm the predictive power of the exchange rate on stock price which can be considered as a novel attempt.

Given the above context, the main focus of this study is to investigate the relationship between exchange rate and stock price: evidence used from SAARC countries. Which raise the research question whether the share price is influenced by exchange rate and how.

1.3 Research Objectives

To explore the research problem outlined above, following research questions were addressed by this study.

1. To identify dynamic relationship between FOREX and stock prices in SAARC countries
2. To test the short run, long run relationship and causality between FOREX and stock prices

2. LITERATURE REVIEW

2.1 Theoretical Review

The relationship between exchange rates and stock prices has been a subject of extensive research in the field of international finance. Existing literature identifies two main channels through which exchange rates and stock prices are linked. The first is the flow-oriented model, which suggests that a country's trade balance determines its exchange rate. This model posits that adjustments in exchange rates can influence the international competitiveness of a country's domestic economy and trade balances, which in turn impacts stock prices (Wu et al., 2020). Specifically, the appreciation of a country's domestic currency makes exporting goods more expensive and induces a decline in both foreign demand and profits, leading to a decrease in the stock prices of the export-dominant economy (Wu et al., 2020).

On the other hand, the stock-oriented model suggests that stock prices can also influence exchange rates. This model argues that expectations regarding movements of financial asset prices play an important role in affecting exchange rate dynamics (Nandy & Chattopadhyay, 2019). Globalization has led to an increased market for currencies in which the securities are denominated, thus creating interdependence between stock returns and exchange rate changes (Nandy & Chattopadhyay, 2019).

The existing literature has also explored the dynamic linkages between exchange rates and stock prices, particularly within the context of emerging markets.

2.2 Empirical Review

Empirical studies examining the relationship between exchange rates and stock prices, particularly in SAARC countries, have yielded mixed results, reflecting the complexity of the interaction and the influence of country-specific factors, and the chosen time period.

Some studies have found a negative relationship between exchange rate appreciation and stock prices. (Lee et al., 2011) notes that early research, such as Frank and Young, found no significant interaction, while later work by Soenen and Hennigan showed a significant negative correlation. This negative relationship is often attributed to the reduced international competitiveness of domestic firms when the domestic currency

appreciates, leading to lower exports and profits, and consequently, declining stock prices. (Arwade, 2019), focusing on the Indian context, suggests that exchange rate depreciation can negatively impact stock markets, indicating a positive correlation between the two variables.

However, other studies have documented a positive or insignificant relationship. (Dash & Sahu, 2018) found unidirectional Granger causality from exchange rates to stock market returns in several countries, supporting the flow-oriented model where exchange rate changes precede stock price movements. (Kassouri & Altıntaş, 2019) examined the relationship between stock prices and the Turkish Lira, acknowledging the potential for non-linearity and asymmetric adjustments, suggesting that the relationship may not be uniform across different market conditions.

Using monthly data from 2001to 2018, based on VN-Index stock price collected from Ho Chi Minh Stock Exchange (HOSE) Dang et al., (2020) posited that the asymmetric effect of exchange rate changes on stock prices in Vietnam. According to ARDL results, the currency appreciation affects a stronger transmission of stock prices when compared to the long-run currency depreciation. In the absence of asymmetry, the exchange rate only has a short-run impact on stock prices. This implies a symmetrical assumption that underestimates the impact of exchange rate changes on stock prices in Vietnam.

Furthermore, the impact of external shocks and global economic conditions can significantly influence the exchange rate-stock price nexus. (Alimi & Adediran, 2023) analyzed the relationship during the COVID-19 pandemic, highlighting differences in the dynamics between advanced and emerging economies. This suggests that global events can alter the established relationship and introduce new complexities.

The role of capital flows and market sentiment has also been explored. (Attaullah et al., 2022) examined the interconnectedness of stock market volatility and exchange rate movements in emerging and developed economies, emphasizing the role of regime shifts and market interconnectedness. (Sanwal & Ismail, 2022) focused on India, finding a significant relationship between foreign institutional investment flows, the stock market, and the exchange rate.

Overall, the empirical evidence remains inconclusive, with studies supporting different theories and reporting varying results depending on the context. This highlights the need for further research that considers country-specific factors, industry dynamics, and the potential for non-linear relationships to fully understand the complex interplay between exchange rates and stock prices.

2.2.1 Machine Learning: Predictability of Stock Index using Exchange Rate

One of the main researches conducted using Machine learning (ML) is Amat et al. (2018). This research applies the random forest, support vector machine (SVM), and

neural network models to four fundamental theories utilizing an exponential weighted average technique and sequential ridge regression with discount factors (uncovered interest rate parity, purchase power parity, the monetary model, and the Taylor rule models).

Furthermore, the results' robustness is thoroughly tested in three machine learning models using six government bonds with different maturities (1, 2, 3, 5, 7, and 10 years) and four price indexes (the producer price index (PPI), the consumer price index (CPI) of all items, CPI excluding fresh food, and CPI excluding fresh food and energy). These factors should be combined to offer clear evidence for the outcomes gained. When compared to the random walk, the results show considerably different predicted accuracies, but some random forest results exhibit the same accuracy as the random walk. Second, when comparing the performance of core models integrated with machine learning, the PPI-based models consistently exhibit strong predictability. However, Mehak et al (2016) implies that Stock market performance can be predicted using machine learning techniques. Yet, with only 100 instances, the model was able to forecast the model's 33 performance to a good extent, demonstrating that stock exchange can be predicted using machine learning approaches.

2.3 Theoretical Framework

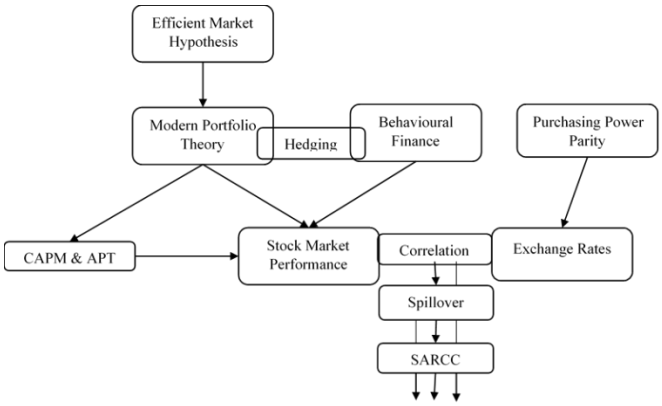


Figure 1: Theoretical Framework

3. METHODOLOGY

3.1 Research Design

Through this study, it is expected to understand the dynamic relationship between the exchange rate and stock market which was broken to identify the short-term relationship and the long-term relationship. Further, the prediction power of the exchange rate on the stock price will be tested using machine learning

3.2 Sample and Data

Data, Weekly average FOREX and Share price indices has been collected for the period 2014-2024 of 10 years from Investing.com and world bank database. the accuracy has been randomly crossed checked using the respective websites of the stock exchange and respective central bank reports. Number of observations is summed up to the 4440 observations, 555 observations from each variable.

Table 1: Variables

Country	Forex	Stock Exchange	Stock Index
India	INR/USD	NSE	SENSEX
Pakistan	PKR/USD	PSX	KSE-100
Bangladesh	BDT/USD	DSE	DSE 30
Sri Lanka	LKR/USD	CSE	CSE All share price index

Analysis is started off with descriptive statistics of both variables then will be subjected to the unit root test on checking stationarity. Then the Johannsen cointegration test will be conducted on identifying the weather each country is having long term or short-term relationship with regards to forex and stock price. Depending on the results if the null hypothesis being accepted it is deciding that countries have short term relationships within the variable. Thereby only the VAR model will be conducted if not VECM will be conducted. The necessary diagnostics has been conducted on deciding the viability of the mode. Impulse response and variable decomposition test how the shock of one variable impact on another. Ultimately granger causality will be looked upon whether the data has unidirectional or bidirectional results. This result will be directed to the machine learning model on identifying the predicting power of exchange rate on stock price.

4. DATA ANALYSIS

4.1 Descriptive Statistics

Since the data used in the study is continuous, main descriptive measures such as mean, median, max, min, std deviation, skewness and kurtosis of each variable will be explored.

Table 2: Descriptive Statistics- Stock Price

	ASPI	DSE	KSE	SENSEX
Mean	7523.619	1971.551	43270.81	13033.69
Median	6722.200	1959.940	41335.53	11174.75
Maximum	13371.61	2767.380	101439.8	26178.95
Minimum	4439.040	1321.490	28109.57	6694.800
Std. Dev.	1971.939	286.0032	12100.63	4937.252
Skewness	1.110740	0.204699	2.051302	0.796215
Kurtosis	3.189837	2.908185	7.857016	2.517516

Jarque-Bera	114.9546	4.070864	934.7578	64.02438
Probability	0.000000	0.130624	0.000000	0.000000
Sum	4175609.	1094211.	24015301	7233698.
Sum Sq. Dev.	2.15E+09	45315988	8.11E+10	1.35E+10
Observations	555	555	555	555

According to Table 2, the mean value of the stock index prices of ASPI, DSE, KSE and SENSEX are 7,523.62, 1,971.55, 43,270.81, 13,033.69 respectively. The direct comparison with regards to the value of the Price indices cannot be done as the value represents their respective currency values. However, in terms of volatility, KSE shows higher volatility while DSE being the lowest. All the Stock indices are positively skewed.

Table 3: Descriptive Statistics- FOREX

	LKR	**BDT**	**PKR**	**INR**
Mean	205.1710	88.07602	161.4516	71.89986
Median	180.2500	84.24000	153.1800	71.26800
Maximum	368.5000	119.5770	306.6900	84.56000
Minimum	130.1700	77.25000	96.42000	58.52500
Std. Dev.	75.30333	12.00454	63.99442	7.207167
Skewness	0.991430	1.334095	0.904860	0.256425
Kurtosis	2.469967	3.384879	2.466112	1.909861
Jarque-Bera	97.41791	168.0580	82.32784	33.56406
Probability	0.000000	0.000000	0.000000	0.000000
Sum	113869.9	48882.19	89605.67	39904.42
Sum Sq. Dev.	3141507.	79836.33	2268788.	28776.57
Observations	555	555	555	555

As depicted in Table 3, Mean value of the of the LKR BDT, PKR and INR are shown as, 205.17 Sri Lankan rupees (LKR), 88.08 Bangladesh Taka (BDT), 161.45 Pakistani rupees (PKR) and 71.90 Indian rupees (INR) respectively. The highest currency can be seen from LKR while lowest being the INR. Within the selected time range, the Maximum currency value is 368.50- LKR while minimum currency value is owned by INR (84.56). Further, the mean value is higher than median value which indicates that LKR, BDT, PKR and INR are positively skewed. According to standard deviation, PKR and LKR show much volatility compared to the other two currencies. Higher volatility can be seen in LKR as the standard deviation being higher compared to INR which shows the lowest standard deviation. As these currencies are based on the dollars this implies that Sri Lanka has the highest local currency depreciation compared to the other South Asian countries.

4.2 Bivariate Statistical Analysis

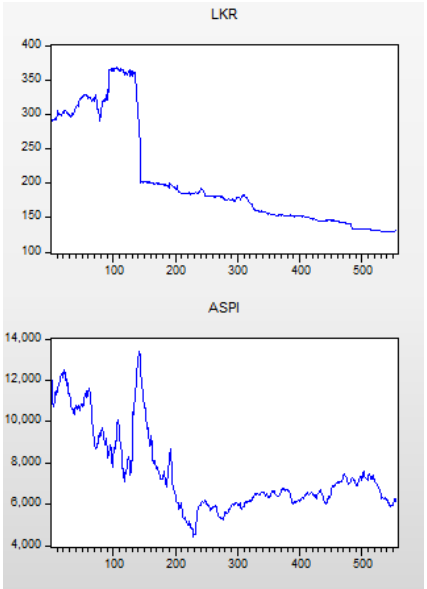
4.2.1 Correlation

Table 4: Correlation

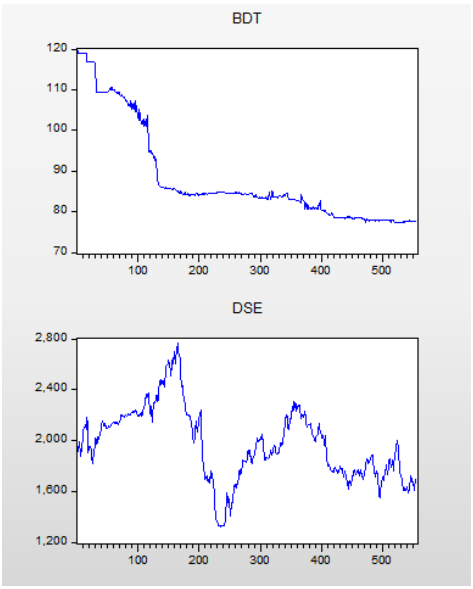
Variables	Correlation	Description
ASPI- LKR	.7126	Strong positive correlation
DSE - BDT	. 3316	Weak positive correlation
KSE - PKR	.6440	Moderate positive correlation
SENSEX- INR	.8999	Strong positive correlation

Thereby, in Bangladesh, the correlation between the DSE and BDT shows weak positive correlation (.3316) whilst, KSE and PKR shows moderate positive correlation (.6440). However, SENSEX vs INR and ASPI vs LKR on the other hand is having the strong positive correlation of .8999 and .7126 respectively. this relationship can be confirmed graphically
as depicted in figure 2.

LKR-ASPI



BDT-DSE



KSE-PKR

INR-SENSEX

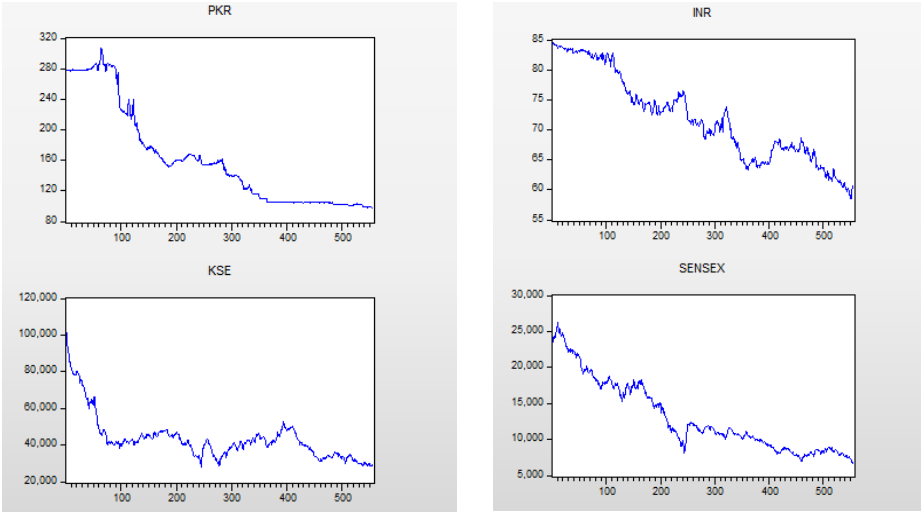


Figure 2: Share Price and FOREX Movement in Each Country

4.2.2 Assessing the Stationarity

Trend identification and graphical confirmation can be observed from the graphs depicted in the figure 2 where it shows mixed results hence, the statistical test as ADF test is needed to confirm the stationarity of the data set.

Dickey and Fuller (1979, p.427), if $p < 1$, ($p < 0.05$) the time series yt goes towards stationarity, thereby the ADF test has been run for each variable on three test equation models i.e. Constant, trend and intercept and none. All the variables are stationary under 1st difference.

4.2.3 Optimal Lag length

Firstly, to find the lag length selection criteria, unrestricted VAR was performed in selecting the information criterion. Consequently, lag specification test was performed on identifying the optimal lag length criterion. Thereby for each country analysis, optimal lag length was decided as,

Sri Lanka	10
Inida	2
Bangladesh	3
Pakistan	7

On selecting the lag length, apart from based on lowest AIC criterion, other criterion decisions were considered as well.

4.2.4 Cointegration

After the optimal lag length decision. Cointegration test will be conducted on identifying whether the variables are having short term/ long term relationships. Accordingly, to the test results of the cointegration (null hypothesis being rejected) the suitable VAR model will be decided. The test statistics summary depicts in table 5.

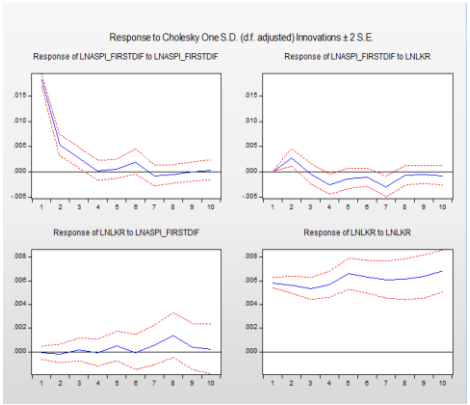
Table 5: Johanson Cointegration Test

		Eigenvalue	**Trace Statistics**	**0.05 critical value**	**Probability**
lnASPI_ lnLKR	Trace	0.0197	8.2146	15.4947	0.4427
	Maximum Eigenvalue	0.0197	8.0177	14.2646	0.3769
lnSENSEX lnINR	Trace	0.0183	7.5416	15.4947	0.5156
	Maximum Eigenvalue	0.0183	7.5290	14.2646	0.4286
lnDSE lnBDT	Trace	0.0202	8.4404	15.4947	0.4196
	Maximum Eigenvalue	0.0202	8.3253	14.2646	0.3466
lnKSE and lnPKR	Trace	0.0149	5.5855	15.4947	0.7439
	Maximum Eigenvalue	0.0140	5.5634	14.2646	0.6696

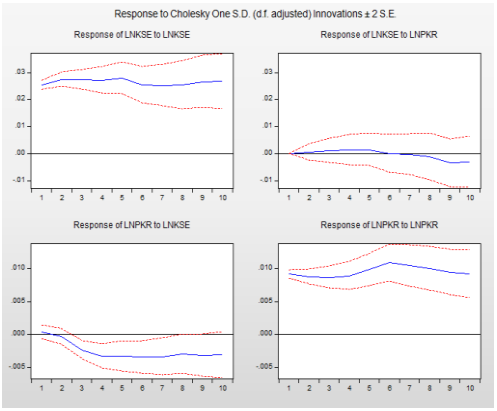
Based on Table 5, according to the test statistics, all the equations fail to reject the null hypothesis, “No cointegrating in equation”. Thereby all the equation fails to prove that there’s a long run relationship between exchange rate and stock price in four countries. In conclusion it is to say that there’s no cointegration relationship between the exchange rate and stock prices in South Asian Countries. This brings up a mixture of results compared to the previous research done Muhammad & Rasheed (2002), showing a long run relationship exists in Sri Lanka and Bangladesh and no long run relationship between India and Pakistan.

4.2.5 Impulse Response

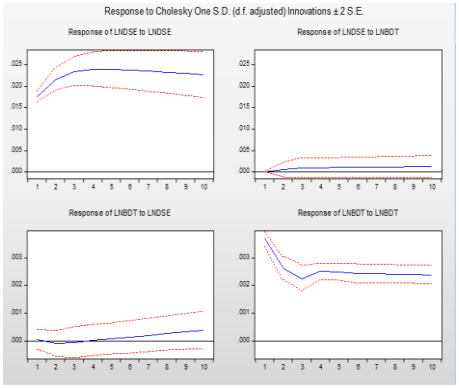
LnASPI and ln LKR



LnKSE and lnPKR



lnDSE and lnBDT



lnSENEX and lnINR

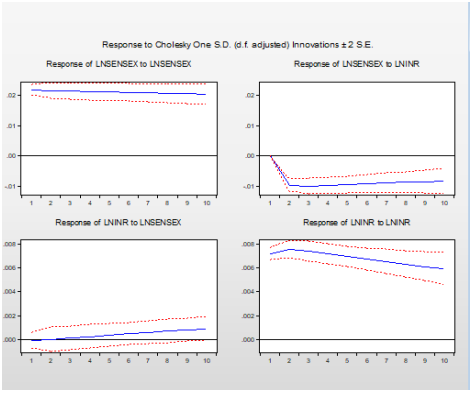


Figure 3: Impulse Responses of Each Country

As in the figure 3, In terms of lnASPI and lnLKR when one standard deviation shock happened to the LKR, when LKR increases, the lnASPI_first difference too will increase reaching maximum percentage variation of .3 around 2nd week, in starts to decrease an till 4th week and gradually steady around 10th week. On the other hand, when standard deviation shock happens to lnASPI, LKR does not show immediate response except small volatility till 4th quarter, around 5th week till 6th week, from 6th week to 10th week, LKR will show slight increase and then back to the steady state.

The impulse response of KSE and PKR, when standard deviation shock occurred to PKR, KSE is showing a small volatility yet shows steady movement. On the other hand, when standard deviation shock occurs in lnKSE PKR will start to decrease.

As depicted in the chart, a standard deviation shock occurred to lnBDT, lnDSE will make slight increase and make it a steady movement. Inversely, when standard deviation shock happens to the lnDESE BDT shows no significance changes till 4th week yet will make slight increase in from there.

The impulse response of INR and SENSEX, when standard deviation shock arises in lnINR, lnSENSEX will start a steep decrease till 2nd week then make the impermeable increase from 2nd week. Contrarily, when standard deviation shock occurred to lnSENSEX, lnINR does not show significant volatility till 2nd week yet will make slight increase from then.

4.2.6 Granger Causality

Table 6: Granger Causality

Dependent Var	Independent Var	Probability
lnASPI	lnLKR	.0001
lnLKR	lnASPI	.0002
lnDSE	lnBDT	.8380
lnBDT	lnDSE	.0747
lnPKR	lnKSE	.0006
lnKSE	lnPKR	.3535
lnSENSEX	lnINR	.0000
lnINR	lnSENSEX	.0500

P value (0.0001) less than critical value of 0.05, rejects the null hypothesis,

As per in the table 6, Granger causality results can be described as,
“Whereas the independent variable LKR, do not granger cause ASPI” is rejected at 5% level of significance. This implies LKR granger cause ASPI
Further, second scenario, P value (0.0002) less than critical value 0.05, rejects the null hypothesis, “Whereas the independent variable, ASPI do not granger cause LKR” is rejected at 5% level of significance. This implies ASPI granger cause LKR.

Considering the scenario in Bangladesh, according to the Granger causality test, both Stock index and Exchange rate do not show significant results hence, null hypothesis is accepted.

However, in Pakistan the situation is different as the influence of exchange rate (PKR) on the stock index (KSE) is significant (.0006< 0.05) indicating that exchange rate granger cause Stock index. Yet conversely, the impact of stock Index (KSE) on the exchange rate (PKR) is insignificant at 5% level. Do not reject the null hypothesis.

Finally, In India, independent variable INR, do not granger cause SENSEX” is rejected at 5% level of significance. Yet could be accepted at 10% significance. This

implies INR granger cause SENSEX. Contrariwise, the influence of Stock index (SENSEX) on exchange rate (INR) is also significant at 5% hence, it is to conclude that SENSEX Granger cause INR.

4.2.7 Machine Learning: Predictability of Stock index (ASPI) using the exchange rate (LKR)

As the Granger causality test depicts that exchange rate granger cause stock index, the extra step has been taken to predict the Stock index price (ASPI) using the exchange rate (LKR/USD). This has been built around the RNN model (number of hidden layer units and number of samples in sequence) and it is comparing the accuracy of different parameter values. In the adjusting phase, the optimal model is applied to all selected stocks and the actual stock trades are reproduced.

In the field of artificial neural networks, optimizing the number of neurons in the invisible layer for various tasks remains an unresolved challenge. Very few hidden units can cause major errors due to overfitting, and very few hidden units can cause major errors due to overfitting. Some scholars have suggested statistics to determine the optimal number of invisible units for all ANN functions. Consider the following scenario. The number of hidden units should not exceed the number of units in the input layer. The size of the hidden units should be between the input and output units, and the number of neurons should capture 70-90% of the variance in the input data set.

The five samples in the sequence are used to evaluate alternative hidden layer configurations and are prone to repetitive training errors (less than 10). As the output and input of the RNN block are equal, the number of neurons in the hidden layers A and B should be the same. The following figure shows the test results.
As depicted in the figure 4, according to the machine learning prediction, the predicted stock price will vary in the steady price range which is depicted in the blue

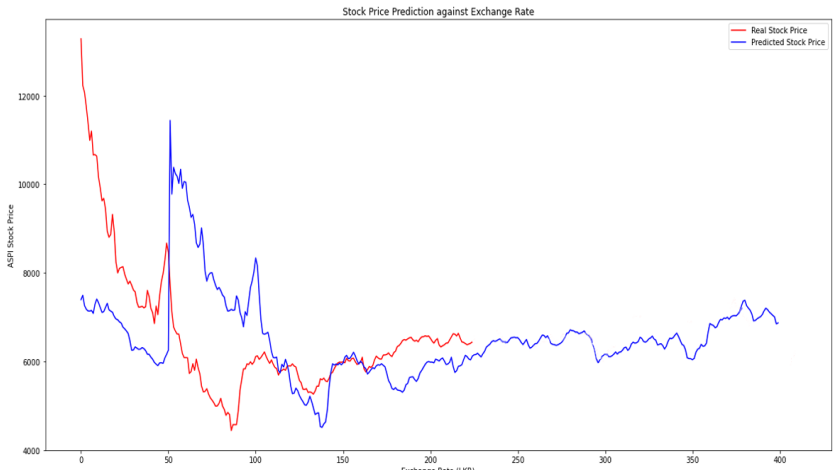


Figure 4: Machine Learning Prediction

line. However, considering the data input exchange rate is expected to rise.
discussing the technical aspect machine learning model, the LSTM, a subclass of LSTM, has been used to predict the stock market. Frequently occurring neural networks to test the generalizability of the LSTM model, an inventory is chosen at random to test optimal allocation as a configured inventory. Once the LSTM model to the entire dataset. As a result, the LSTM model gives 70.19% accuracy in its forecasts for all stocks.

Thereby, it is concluded that at 70.19% accuracy, exchange rate can be used to predict the stock price. However, the result can be subject to change due to the impact of other economic factors.

5. DISCUSSION

Considering the empirical analysis, 1st the univariate analysis has been done to identify the individual statistical characteristics of the variables. Thereby, with regards to the exchange rates arbitrary comparison can be done as all the values are representing their exchange rate for a dollar. The higher volatility can be seen in LKR as the standard deviation being higher compared to BDT which shows the lowest standard deviation. As these currencies are based on the dollars this implies that Sri Lanka has the highest local currency depreciation compared to the other South Asian countries. First, the variable ASPI, LKR, KSE, PKR, DSE and BDT were subjected to the descriptive statistical analysis, thereby, results show that LKR, PKR, ASPI, SENSEX and DSE have positive skewness and while INR, BDT and KSE have negative skewness. The Pearson Correlation Analysis shows positive correlation of all the variable pairs yet, except India, all the countries showed weak positive correlation between exchange rate and the stock index price. Antecedent to the descriptive analysis, Stationarity has been checked using ADF test and all the variables are stationary at the 1st difference. This implies that all the data series in four countries are integrated for order one i.e. I (1) which shows the need of applying cointegration test to check the long-term relationship. In performing Johannsen cointegration tests, it reveals that there's no long run equilibrium relationship between exchange rate and stock prices in all four countries. According to the VAR estimations, in Sri Lanka, India and Pakistan, lags of both variables can be used to estimate the endogenous variable i.e. exchange rate or stock price. However, Bangladesh shows a unidirectional relationship. This has been proven from Granger Causality test statistics. Finally taking the insights from all the statistical tests, the machine learning model has been run on predicting the stock price using the exchange rate capturing 70% - 90% variance.

6. CONCLUSION

The empirical evidence brought up in this paper shows that there's a significant short run relationship between the exchange rate and the stock price. This has been proven by employing Cointegration, VAR estimations, Granger Causality, Impulse response function and Variance decomposition. All four countries have positive correlation

which implies that depreciation of the domestic currency will increase the stock prices. Further, this relationship is statistically tested to be the short term. These findings support the portfolio balanced theory which implies that currency depreciation causes the stock price appreciation. Hence, local enterprises could gain advantages. Nonetheless, these discoveries satisfy the objective 01 and objective 02 of this study to investigate the dynamic relationship between the stock price and the exchange rate.

However, from the Granger Causality it was found that stock price and exchange rate is bidirectional in Sri Lanka, India, while Pakistan shows the unidirectional relationship where only the exchange rate granger cause on stock price. Nevertheless, except India, all the other four countries imply weakly positive correlation between exchange rate and stock price. Which implies two factors. First, even though there's positive relationship domestic markets depreciation of the currency rate would not be greatly reflect within the stock price. Second, disregarding the direction of the relationship according to the traditional approach, between e bidirectional relationship can be connected with the theories explaining the linkage between exchange rate stock price accordingly, as argued by the floworiented models when the domestic currency of Sri Lanka countries depreciates, cash flow and the profitability of local firms should deteriorate this will lead to fall in the stock prices. According to the stock-oriented theory, decrease in the stock prices would reduce the domestic wealth lower the demand for money and low interest rate that which causes capital outflow eventually. (Ding, 2021) This implies that currency depreciation not always brings the positive impact. Hence the floating exchange rate should be managed with care.

Further, the shock of a variable will be reflected in the other variable after a certain period of time (lag) which may or may not improve the predictive power of the model. Therefore, it is recommended that policy makers should pay proper attention the "reaction" gap of policy changes in the economy. Moreover, it can be concluded that policy makers could not use exchange rate alone to make policies. However, with a well-developed machine learning model, moving forward from the initial attempt of this study, could be used as a good indicator to understand how the stock price would behave in the future.

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THE IMPACT OF LIQUIDITY RISK ON THE FINANCIAL PERFORMANCE OF LICENSED COMMERCIAL BANKS IN SRI LANKA

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Abstract

The importance of liquidity risk management prompted the global financial crisis in 2007 as it highlighted the significance of ensuring adequate liquidity to withstand adverse issues in the financial system. The funding pressures in 2007, underlined the deficiencies in the liquidity risk management practices in the financial system and thereby the Basel Committee introduced Basel accord III emphasizing the importance of liquidity risk management. As liquidity and profitability are prerequisite factors of the sustainability of the financial system, it is vital to analyze the impact of liquidity risk on financial performance. Thus, the main objective of this paper is to investigate the impact of liquidity risk factors and their significance on the performance of domestic Licensed Commercial Banks (LCBs) in Sri Lanka by analyzing data from twelve domestic LCBs from 2011-2021 using panel data regression analysis. The performance was measured using Return on Equity (ROE) and Return on Assets (ROA) where liquidity risk was measured using Non-Performing Loan Ratio (NPLR), Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Current Ratio (CR), Loan to Asset Ratio (LAR), Value of deposits (Deposits) & Liquidity Gap (LG). As per the findings, Deposits and NPLR had a negative significant impact while CAR had significant positive impact on bank performance. This study suggests that it is important to strengthen liquidity risk management to preserve the profitability of the banks in Sri Lanka and recommends that bank management need to take multiple actions such as creating a steady liquidity risk management framework, setting and reviewing risk limits regularly, implementing a strong Management Information System, conducting stress testing and creating and implementing a Contingency Funding Plan to mitigate liquidity risks.

Keywords: Liquidity Risk, Licenced Commercial Banks, Panel Data Analysis, Profitability, Return on Equity, Return on Assets, Sri Lanka

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1. INTRODUCTION

A healthy economy depends on a healthy financial system. Financial system stability means a safe and secure financial system which is able to withstand external and internal shocks. A stable financial system creates a favourable environment for depositors and investors, encourages financial institutions and markets to function effectively and efficiently, and hence, promotes investment and economic growth. Financial system stability requires a stable financial and economic environment within an impactive regulatory framework and a safe and robust payment and settlement system. The maintenance of financial system stability entails identifying and addressing potential vulnerabilities and risks to the financial system.

Banks play a critical role within the Sri Lankan financial system, as they are engaged in provision of liquidity to the entire economy, while transforming the risk characteristics of assets. Banks are also engaged in providing payment services, thereby facilitating all entities to carry out their financial transactions. On the other hand, banks can create vulnerabilities of systemic nature, partly due to a mismatch in maturity of assets and liabilities and their interconnectedness. Therefore, the soundness of banks is important, as it contributes towards maintaining confidence in the financial system, and any failure may have the potential to impact on activities of all other financial and non-financial entities, and finally the economy. No doubt the roles of banks in any economy are numerous and every economic activity revolves around credit or money (Adeniyi et al, 2021).

In the Sri Lankan context, the Central Bank of Sri Lanka (CBSL) regulates all the banks and other financial institutions in Sri Lanka under the Banking Act No. 02 of 2005. Banks play a central role in providing liquidity and maintaining the payment system. The Sri Lankan banking system consists of 24 Licensed Commercial Banks (LCBs) and 06 Licensed Specialised Banks (LSBs) and continue dominating the financial sector of the economy accounting for nearly 62% of the total asset base at the end of 2022 (CBSL,2022). LCBs are considered as the single most important category of financial institutions in the banking sector as they dominate with asset base of nearly 55% as of 2022 (CBSL,2022). Thus, these statistics depicts the vital role played by the commercial banks in the economy through facilitating payments and settlements, matching savers and borrowers and conducting multiple roles simultaneously.

However, when conducting these multiple roles in the economy banks are generally exposed to several types of risks, such as credit risk, operational risk, liquidity risk, market risk, legal risk, technological risk etc. Out of these multiple risks, liquidity risk is considered as the second largest risk faced by banks according to the CBSL as of 2023 (CBSL, 2023). Bank's liquidity can be defined as the bank's ability to meet expected and unexpected cash flows and collateral needs efficiently without creating adverse effects for daily operations or the financial condition of the bank. The liquidity of a bank exists in the assets that can be convertible to cash, net operating cash flows and ability to acquire funding through deposits, borrowings and capital

injections (Comptroller, 2023). The basic business model of a bank is matching short term funds with long term assets by creating a negative maturity gap of assets and liabilities. This negative maturity gap leads towards creating liquidity risk for the bank if they become unable to raise sufficient funds from the banks or from the market. Thus, the liquidity risk can be identified as the inability of a bank to meet its liabilities/ obligations as they become due (Dayananda, 2017). The obligations of the banks and its funding sources used to meet them depends mainly on the business mix, balance sheet structure and the cash flow profiles of on and off balance sheet obligations. There are multiple bank specific factors and external factors that can impact liquidity risk. In terms of bank specific factors, decline in asset quality, events such as accounting scandals, adverse consumer or market events that affect public reputation, decline in earnings performance, downgrading in credit rating and breakdowns in internal systems can impact liquidity risks. On the other hand, in terms of external factors, decline in local economic conditions, drastic changes in national or global economic conditions, financial scandals, disturbances to payment and settlement systems and natural disasters can create liquidity risks (Comptroller, 2023).

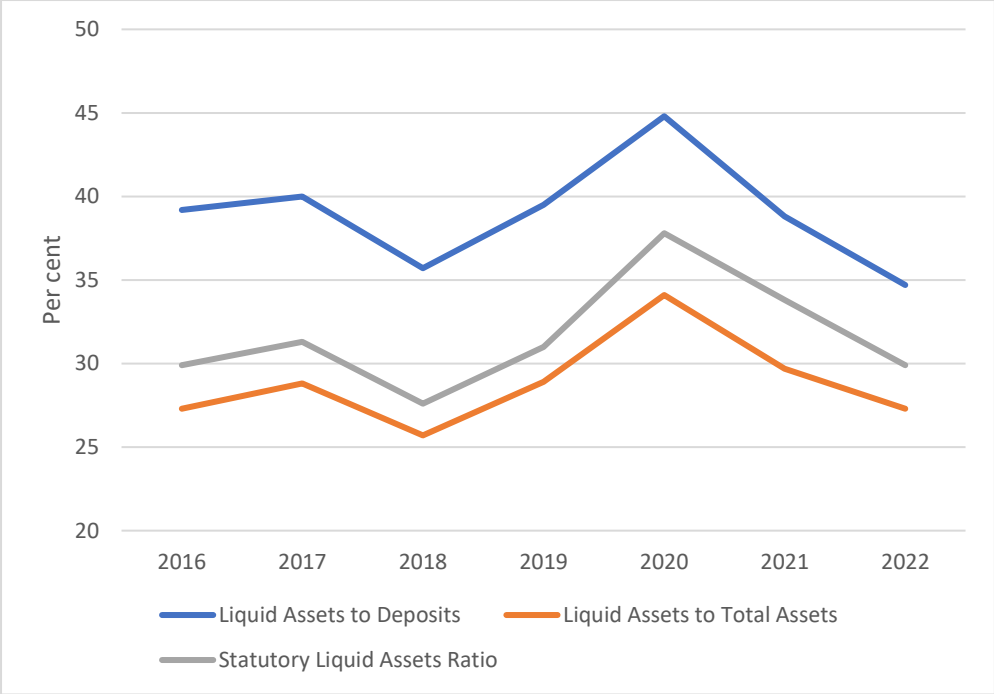
Liquidity risks faced by banks can be categorized as funding liquidity risk and market liquidity risk. Where funding liquidity refers to the level of liquidity where the bank is able to meet all the present and future cash flows, expected and unexpected without any material impact for the daily operations or the overall financial condition. This funding liquidity is mainly decided by the holdings of cash and other liquid assets, funding structure and the amount and type of contingent liabilities. On the other hand, market liquidity refers to the ability of the participating banks to exchange financial assets without any material effects on prices (Dayananda, 2017).

Liquidity risk can adversely affect both bank's earnings and the capital. Therefore, it becomes the top priority of a bank's management to ensure that sufficient amounts of funds are available to meet the demands of depositors and borrowers of the bank (Arif & Anees, 2012). The importance in liquidity risk management is that it can even lead to insolvency and bank runs if there is a sudden rise in demand of borrowers (Oldfield & Santomero, 1997). In addition, liquidity risk affects both the performance as well as the reputation of the bank, as the bank may lose confidence of the depositors if funds are not provided to them timely (Jenkinson, 2008). Further, liquidity risk may cause penalties from the regulators (Arif & Anees, 2012). Consequently, minimizing the liquidity risk is one of the most important aspects of asset and liability management of banks (Maduwanthi and Morawakage,2019).

The banking sector in Sri Lanka is governed by the CBSL regulations and required to maintain a minimum amount of liquidity ratios to avoid any liquidity risks in the banking system. Statutory Liquidity Asset Ratio (SLAR), the banks operating in Sri Lanka should maintain a minimum amount of 20% of statutory liquidity assets, where the bank should measure the statutory liquidity assets according to Section 86 of the Banking Act, No 30 of 1998. If a bank fails to maintain the minimum SLAR, it would result in a cash penalty for the bank. Another important ratio is Liquidity Coverage

Ratio (LCR), which was imposed by the CBSL in accordance with "Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring" (Dayananda, 2017). As per King and Tarbert (2011), under Basel I and Basel II, much attention was given to improve the capital requirements of internationally active banks. However, with the global financial crisis in 2008, the importance of maintaining sufficient liquidity levels was realized as the financial crisis was not so much of a capital crisis but rather a liquidity crisis. During the financial crisis, many banks and financial institutions found it difficult to convert their assets into cash and were forced to make use of central bank lending facilities. Ultimately, decline in liquidity led towards erosions in capital levels. Thereby, the Basel Committee on Banking Supervision (BCBS) published the Principles for Sound Liquidity Risk Management and Supervision in 2008 and introduced the LCR and Net Stable Funding ratio (NSFR). LCR is considered as the stock of high quality liquid assets which can be converted easily and immediately into cash in the secondary market to meet the liquidity needs of a bank for a period of 30 days when there is liquidity stress scenario (CBSL, 2022). All the banks are required to meet LCR at 100% from 1st of January 2019 onwards. In addition, the CBSL introduced NSFR, in 2019 which requires banks to maintain sufficient amounts of stable funding sources (CBSL, 2022).

In terms of the banking sector in Sri Lanka, banks faced a critical pressure on liquidity during 2022. Although the banking sector was able to maintain SLAR above the minimum requirement of 20%, it could be observed that it declined steeply from 44.8% in 2020 to 29.9% in 2022. In 2022, certain domestic banks depended heavily on the standing facilities provided by the CBSL for their day today liquidity requirements (CBSL,2022). The LCR of the banking sector stood 237.5% and 191.2% by the end of 2022, which was well above the minimum requirement of 90% (CBSL,2022). On the other hand, the NSFR introduced in 2019 stood at 140.8% at the end of 2022 well above the regulatory requirement of 90% (CBSL,2022). However, despite the banks meeting the minimum liquidity requirements, there was a high widening of the maturity gaps which increased the liquidity risk.



Source: Central Bank of Sri Lanka

Figure 1: Liquidity Ratios of the Banking Sector

The attention towards liquidity risk in the banking sector aroused as a consequence of the US subprime crisis erupted in 2007, severely impacted the global financial markets and the US economy. At this point, BCBS indicated that liquidity was one of the root causes of the crisis and indicated that banks that heavily rely on short term money market to finance their asset operations suffered more from a shortage of liquidity. For instance, the Northern Rock one of the largest British mortgage lenders experienced severe liquidity crisis during the financial crisis period (Chen et.al,2018). Similarly, there were deficiencies in bank liquidity management in Europe which led towards the 2008 global financial crisis and 2010-2012 sovereign debt crisis. Aftermath the crisis, Basel III accords introduced new liquidity requirements which mandates banks to hold sufficient liquidity to absorb external shocks and hold stable funds to perform their daily lending activities even during critical situations (Distinguin et.al,2023). On the other hand, there are multiple occurrences in the Sri Lankan financial sector where banks and non-banking financial institutions such as Pramuka Bank, Seylan Bank, Edirisinghe Trust Investments (ETI) which were liquidated due to bankruptcy (Wijenayaka & Amarasinghe,2022). These companies faced severe liquidity issues and they failed to pay their depositors and ultimately ended up in liquidation. With these global and local incidents, the necessity for proper liquidity management aroused and resultantly the CBSL introduced the LCR and NSFR ratios mentioned in the Basel III to the local banks. Thus, it become important to analyze how liquidity risk impact on profitability of the banking sector.

Therefore, this study will mainly focus on investigating the impact of liquidity risk on profitability of the commercial banks in Sri Lanka. Accordingly, the study will be conducted with the objectives of identifying the significant liquidity risk factors which affect bank profitability and identifying the impact of liquidity risk factors on bank profitability. This research will contribute towards the literature of bank risk management as the number of studies conducted to analyse liquidity risk is minimum in the Sri Lankan context. Thus, this paper helps in understanding the significant factors of liquidity risk and their impact on the profitability of the banking system. The findings of this research will further support bankers and shareholders of the financial institutions to take efficient risk management decisions and forecast risks that will occur in the future and mitigate them.

2. LITERATURE REVIEW

2.1. Theoretical Review

Douglas Diamond and Phillip Dybvig introduced the Diamond-Dybvig Model in 1983, which highlights the role played by liquidity and the potential for bank runs due to depositors' fear for bankruptcy. This model demonstrates the fundamental mismatch between liquid liabilities of a bank and illiquid assets and promotes deposit insurance and other forms of government intervention as solutions to maintain stability (Diamond & Dybvig,1983). This paper can be considered as one of the most influential articles on bank liquidity management and occurrence of bank runs (Teemu, 2023). The insights gained from this theory is highly relevant and has driven the development of new theories as well as criticisms towards banking models.

2.2. Empirical Evidence

By definition liquidity risk of a bank refers to the risk that a bank's financial condition or overall safety is adversely affected by the inability of the bank to meet its obligations. The business mix, balance sheet structure and cash flows play an important role in determining the ability of the bank to meet its obligations. When managing cash flows, banks encounter various situations that give rise to liquidity risk such as funding mismatches, market constraints to covert assets into cash and contingent liquidity events. And other risks such as operational, market, legal, reputational risks can also affect liquidity risks. Thus, liquidity risk management should be fully integrated to the risk management process of banks (Comptroller, 2023).

Past literature reveals that there are both positive and negative relationships and mixed results between liquidity and profitability of the banks. Many researchers have used bottom line performance indicators to gauge profitability and liquidity ratios to measure liquidity risks. Hakimi & Zaghdoudi (2017) studied the effect of liquidity risk on the Tunisian bank performance. The results showed that liquidity risk decreases significantly Tunisian bank performance. Similarly, Shen et al, (2009) studied the relationship between liquidity risk measures and bank profitability using a panel dataset of 12 advanced economies commercial banks over the period 1994-

2006 and found out that liquidity risk may lower bank profitability (ROA and ROE). In addition, Arif and Anees (2012), found a negative relationship between profitability and liquidity in their study about Pakistani banks.

On the other hand, Azzam & Almaleeh (2022) examined the effect of liquidity risk on performance measures (e.g., return on equity, return on assets, and earnings per share) of banks listed in Egyptian Stock Exchange throughout the period 2009-2019. The results revealed that deposits to liabilities ratio is significantly associated with return on equity (ROE), cash to assets ratio is positively and significantly associated with return on assets (ROA), and liquid assets to deposits ratio is correlated with bank performance measures. Similarly, the results obtained from the research of Ajayi & Lawal (2021), proved that there is a significant and positive relationship between liquidity management and profitability of banks in Nigeria. However, there are some researchers such as Khalid, Rashed & Hossain (2019) who studied the relationship between liquidity and financial performance of commercial banks in developing countries like Bangladesh and showed that liquidity has no significant and positive or negative impact ROA or ROE as financial performance indicators.

In the Sri Lankan context, Wijenayaka & Amarasinghe (2022) investigated the impact of liquidity risk on the bank profitability of commercial banks in Sri Lanka, considering the sample period from 2009 to 2018. Liquidity risk was measured by using the current ratio, capital adequacy ratio, liquid assets to total assets ratio, equity to total assets ratio and the number of deposits while bank profitability was measured by using ROA. In this study, it was found that, current ratio and the number of deposits have a significant impact on bank profitability. Where, the current ratio showed a positive relationship and number of deposits have a negative relationship with profitability. Thus there were mixed results between bank profitability and liquidity. In the study conducted by Maduwanthi and Morawakage (2019), the multiple regression analysis revealed that liquidity risk negatively and significantly affects bottom lines ROA and ROE, while positively affecting the top line Net Interest Margin (NIM) of the commercial banks.

3. RESEARCH METHODOLOGY

This is a quantitative research based on twelve LCBs selected based on the availability of data in the annual reports for the period 2011-2021. Variables employed for the study include measures for liquidity risk and financial performance. Liquidity risk was measured using Loan to Deposit Ratio (LDR), Current Ratio (CR), Loan to Asset Ratio (LAR), Liquidity Gap (LG), Capital Adequacy Ratio (CAR), Non- Performing Loans Ratio (NPLR) and the Value of Deposits (Deposits). Financial performance was measured using ROE and ROA which are commonly used accounting measures to measure the performance. These variables were selected from similar empirical research conducted to measure liquidity and profitability (Wijenayaka & Amarasinghe,2022; Mauduwanthi & Morawakage,2019; Arif and Anees ,2012).

The researcher has used Econometrics Views software to run the panel data regression. Unit Root test was conducted to test the stationarity of data. Panel regression was conducted to investigate the significant impact of liquidity risk factors on banks' performance where a Hausman test was conducted to select between fixed effect model and random effect model to conduct the regression analysis. Based on the Hausman test, random effect model was selected to conduct the regression analysis for ROA as the probability value of chi- square for ROA was greater than 5% significance level while fixed effects model was selected for ROE as the probability value of chi- square for ROE was lesser than 5% significance level.

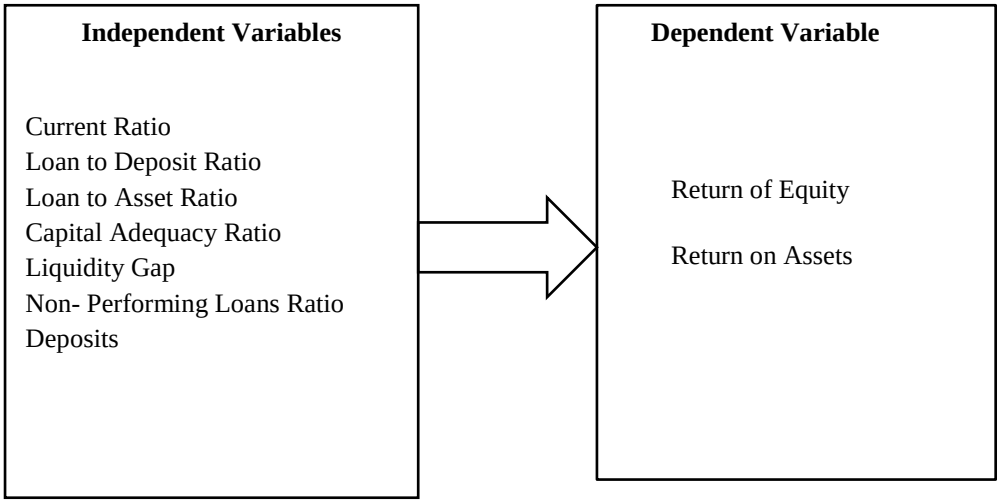


Figure 2: Conceptual Framework

The proposed dynamic models for the study are:

ROE = β0 - β1CR + β2 CAR + β2 NPLR + β3 LDR + β4 LAR+ β5 LG+ β6 NPLR+ β7 Deposits+ ε (1)

ROA = β0 - β1CR + β2 CAR + β2 NPLR + β3 LDR + β4 LAR+ β5 LG+ β6 NPLR+ β7 Deposits+ ε (2)

β1 to β7= beta coefficient

ROE = Return on Equity

ROA= Return on Assets

CR= Current Ratio

CAR = Capital Adequacy Ratio

LDR= Loan to Deposit Ratio

LAR = Loan to Asset Ratio

LG= Liquidity Gap

Deposits= Value of Total Deposits

NPLR= Non- Performing Loan Ratio

4. RESULTS

Descriptive statistics was used to provide a comprehensive idea about the data. Table 1 illustrates the descriptive statistics of liquidity risk factors and performance indicators of LCBs in Sri Lanka.

Table 1: Descriptive Statistics of Liquidity Risk

				LIQUIDITY				CURRENT	
	ROE	**ROA**	**NPLR**	**_GAP**	**LDR**	**LAR**	**DEPOSITS**	**_RATIO**	**CAR**
Mean	15.47	1.45	4.41	5.02E+10	96.15	0.682917	4.97E+11	1.18	15.42
Median	15.62	1.41	4.13	3.70E+10	91.00	0.700000	2.87E+11	1.10	15.00
Maximum	44.69	4.24	15.25	2.01E+11	156.00	1.000000	2.87E+12	2.50	40.90
Minimum	0.30	0.10	1.31	3.00E+09	60.00	0.500000	1.66E+10	0.40	11.07
Std. Dev.	7.49	0.62	2.09	4.34E+10	18.58	0.095543	5.51E+11	0.45	3.27

As per the descriptive statistics (table 01), the bank profitability indicators ROE and ROA show significantly positive values where the mean ROE is nearly 15% for the period 2011-2021 and relatively higher compared to ROA suggesting that the banks have higher financial leverage. The highest NPLR was recorded as 15.25% while the median NPLR of the industry was around 4.13% for the period 2011-2021 mainly due to the economic and social instabilities caused by the pandemic and the economic crisis. Due to the high uncertainties prevailing in the economy, LCBs had to maintain a higher median CAR of nearly 15.00% which is even above the government regulatory requirements. On the other hand, domestic LCBs maintain satisfactory levels of current ratios, but the mean loan to deposit ratio (96%) shows that 96% of the deposits are given as loans, indicating lower liquidity levels.

Table 2: Results of Panel Regression

Variables	ROE		ROA	
	Coefficient	**P-value**	**Coefficient**	**P-value**
Constant	20.04	0.00	0.74	0.25
CAR	0.21	0.22	0.04	0.01**
NPLR	-0.91	0.002***	-0.07	0.01**
LDR	0.01	0.88	0.006	0.11
Current ratio	-0.06	0.95	0.04	0.71
LAR	-0.04	0.99	-0.07	0.89
Liquidity Gap	-1.92	0.68	-8.21	0.87
Deposits	-6.43	0.10*	-5.54	0.19
R squared	0.72		0.52	
F - statistic	13.93		5.85	
Prob (F statistic)	0.00		0.00	

*, **, *** significance at levels of 10%, 5%, and 1%, respectively

Table 02 shows the summary of regression analysis. Coefficient of determination (R^2) is used to measure the goodness of fit of a model. Accordingly, 72% variation of ROE and 52% of the variations of ROA can be explained by the given variables in the models. And also, the probability level of F statistics explains the suitability of the overall model, in the above two models it can be observed that the p-values are less than 0.05 indicating that both the models are suitable. In terms of ROE, only NPLR and deposits have a significant impact while only CAR and NPLR have a significant impact on ROA. The results are consistent with Wejanakaya & Amarasinghe (2022), as the current ratio and ROA exhibited a positive relationship, however there is a negative relationship between current ratio and ROE suggesting that higher liquidity results in declining profits. Furthermore, there is a negative relationship between deposits and profitability which is similar to the finding of Wejanakaya & Amarasinghe (2022) and Arif and Anees (2012) indicating higher the amount of deposits lower the profitability position of the bank. Furthermore, the results are consistent with the findings of Arif and Anees (2012) as the liquidity gap and NPL ratio showed a negative relationship with bank performance. NPLs indicate credit risk which can convert into severe liquidity issues later whereas higher liquidity gaps indicate rising up of costs as banks have to borrow from repo markets at higher rates. Further, the results show that capital adequacy ratio impact bank profitability in a significant manner.

5. CONCLUSION

Liquidity risk can create adverse effects on bank's earnings and capital and ultimately lead towards run on banks. This is because when the banks do not have sufficient liquidity to meet the demands of the depositors, it will reduce the confidence of the depositors towards the bank and thereby the bank will be insolvent. And on the other hand, having too much liquid assets will reduce the bank's profitability as holding liquid assets impose an opportunity cost. Therefore, liquidity management is considered as one of the basic principles in bank management. Liquidity risk can be maintained by having sufficient cash reserves, raising deposits, decreasing liquidity gap and NPLs. Where adequate cash reserves decrease the dependence of the bank on the repo market and reduce the costs on overnight borrowings and to avoid fire sale risks which is known as market liquidity risk.

This research was conducted using panel data of 12 LCBs from 2011-2021 using multiple regression analysis. The study found out that, NPLR, CAR and Deposits have a significant impact on bank profitability whereas the other liquidity risk indicators such as LAR, LDR, current ratio, liquidity gap have not created any significant influence on bank profitability. NPLs strain a bank's liquidity position when borrowers default loan payments and thereby the bank will experience cash flow problems as they depend on these repayments to meet the obligations of the depositors. On the other hand, rising levels on NPLs have a direct adverse impact on bank profitability as it reduces interest income. Furthermore, rising levels of deposits cause the profitability to decline due to the trade-off between liquidity and profitability.

Therefore, it is imperative for the Board of Directors to formulate and establish a liquidity risk management framework which is aligned with the overall risk management strategy of the bank. Mostly, banks appoint an Asset and Liability Management Committee (ALCO) consisting of senior management including the Chief Executive Officer to manage liquidity risk. The ALCO needs to develop policies, strategies and practices to manage liquidity risk in accordance with the risk tolerance level of the bank. Thus, the ALCO and the Board of Directors need to take prompt measures and immediate remedial actions to avoid any adverse consequences of illiquidity. In terms of mitigating liquidity risk, financial institutions need to set and regularly review liquidity risk limits over a particular time horizon where adequate liquidity is maintained. Limits should be set for cumulative cash flow mismatches, for ratios such as LCR, NSFR and SLAR. Further, an important element in the liquidity risk management framework is the Management Information System (MIS) which provides the Board of directors and senior management with current information regarding the liquidity position of the institution. The MIS should be used to check compliance with policies, procedures and limits of the bank and compare current liquidity exposures with the set limits. Further, liquidity stress testing is another prominent risk mitigation mechanism. This considers the ability of a financial institution to meet obligations during periods of stress in the absence of funding such as economic downturn, withdrawal of savings deposits by a

considerable amount, drying up of market liquidity etc. Also, financial institutions need to have a Contingency Funding Plan (CFP) which address the strategy for handling liquidity crises. This can be considered as a backup plan designed to address unexpected shocks, events and risks in the economy. This CFP needs to be implemented when a specific risk occurs and it shows a series of actions to be taken to mitigate the impact of the event. Moreover, banks need to implement internal controls consisting of procedures, processes, reconciliations, reviews which provide reasonable assurance. The above mentioned liquidity risk mitigation methods provide reasonable assurance that the bank achieves liquidity risk management objectives (Comptroller, 2023).

In further research, researchers can use different measures of performance other than bottom line measures to study the impact of liquidity risk factors on profitability and can conduct their studies not only for LCBs but also to other non-banking financial institutions. There is a vital importance of assessing, monitoring and reviewing of the liquidity status of the institutions in the financial sector in Sri Lanka as number of them such as Bimputh Finance PLC, Edirisinghe Trust Investments, Central Investments and & Finance Ltd, TKS Finance Ltd got their licenses either canceled or suspended due to lack of proper administration, resulting lack of confidence among the depositors towards the CBSL as well as the overall financial sector in Sri Lanka.

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IMPACT OF RISK MANAGEMENT ON THE PROFITABILITY OF LICENSED COMMERCIAL BANKS IN SRI LANKA

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Abstract

In today's rapidly evolving financial environment, banks face many risks that can significantly affect their profitability and overall stability. Effective risk management has emerged as a critical factor in maintaining a bank's long-term success and competitive advantage. To overcome these challenges and improve the performance of commercial banks, it is necessary to investigate the factors that influence their operations. The purpose of this study is to analyze the impact of risk management on the performance of commercial banks in Sri Lanka, using return on assets and net interest margin as proxies. The study looks at different aspects of risk management, such as credit risk, liquidity risk, bank capital, and operational risk as well as how they affect a bank's profitability. Panel regression analysis is used in the study to investigate the impact of risk management on commercial banks in Sri Lanka. The study included 10 Sri Lankan commercial Banks listed in the Colombo Stock Exchange (CSE). According to the study's findings, credit risk, bank capital, operational risk had a statistically significant impact on Return on Assets (ROA) and operational risk had a statistically significant impact on Net Interest Margin (NIM). The result highlights that the overall models are statistically significant. The study found that there is a strong impact of risk management on the financial performance of commercial banks in Sri Lanka. The study also established that credit risk management and operational risk management had a strong relationship with financial performance (ROA and NIM). This study concludes that the ROA model can be used as a best-fit proxy for risk management when measuring financial performance.

Keywords: Bank Capital, Credit Risk, Liquidity Risk, Net Interest Margin, Operational Risk, ROA

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1. INTRODUCTION

1.1 Background of the Study

The banking industry contributes significantly to the economic growth of every nation. By offering financial services, well-regulated banks contribute significantly to the economy of any given nation (Kolapo, Ayeni, & Oke, 2012). The most profitable asset of credit organizations is their lending operations, which are core banking activities. The primary objective of managing banks is to improve bank performance to maximize shareholders' returns. This goal is achieved at the expense of higher risk, which is occasionally accompanied by lower returns and may therefore result in underperformance.

According to Gallati (2003), risk is a state felt in an adverse environment or if there is a chance that an expected or hoped-for outcome may differ. Risk, according to Kanchu and Kumar (2013), is anything that prevents the attainment of specific predetermined goals. The business dictionary defines risk as the likelihood or threat of harm, injury, liability, loss, or any other adverse outcomes brought on by external or internal vulnerabilities that may be prevented through preventative action. Banks face a variety of risks in the dynamic and complicated business world of today that could have a big influence on their overall financial health and profitability. To safeguard their interests and improve performance, banks all over the world have come to view risk management as a critical discipline. The performance and operations of banks are impacted by a wide variety of hazards in the banking sector. Risk is categorized as systematic, unsystematic, financial, or non-financial risk. More specifically, these groups include various risks depending on what generates them, including credit risk, liquidity risk, operational risk, market risk, political risk, currency risk, and strategic risk (Imane, 2014).

One important indicator that demonstrates a bank's profitability is the return on assets (ROA). According to Khrawish (2011), it is a ratio of revenue to total assets. Therefore, the corporation is better at generating profits if its ROE is higher. Because they are indicators of financial institution strength and efficient resource use, respectively, the current study will use ROA and ROE as the metrics of profitability in commercial banks. Academics, practitioners, and regulators all agree that effective risk management is a key component of bank management. In response to this reality and the need for a comprehensive strategy to address bank risk management, the Basel Committee on Banking Supervision adopted the Basel I Accords, followed by the Basel II Accords, and most recently the Basel III Accords, to address the issue (Sensarma & Jayadev, 2009). As Sri Lanka's banking sector grows, banks must prioritize risk management to sustain long-term profitability and aid in the country's overall economic growth. Therefore, the primary goal of this study is to find out how risk management impacts bank profitability in Sri Lanka, a rapidly rising South Asian nation.

1.2 Research Problem Identification and Justification

The research problem addressed in this study is the impact of risk management on the profitability of banks in Sri Lanka. Understanding how internationally accepted risk management techniques affect Sri Lankan banks' profitability provides insight into how these tactics interact with the particularities of the nation's financial environment. The purpose of this study is to better manage risk in Sri Lankan banks by analysing how it affects profitability. The results will enhance financial stability and guide policy. Such insights can inform the development of more robust risk management frameworks and policies that can contribute to the sustainable profitability and resilience of the banking sector in the country.

1.3 Problem Statement

Risk management is essential to finding better performance because most banks are in the risk business. This goal is achieved at the cost of higher risk, which is not always accompanied by strong returns and can occasionally result in underperformance.

There are many researchers: Budhathoki et al., (2020); Iannotta et al., (2007) conducted studies based on this topic for different contries. When following research articles that are published on web sites, credit risk is the primary focus of risk management in the majority of banks worldwide. To ensure improved performance, there is a need for comprehensive and holistic risk management in all financial institutions, particularly in commercial banks. According to KPMG Sri Lankan Banking Report in year 2020 highlights the necessity of thorough risk management in banks, particularly in Sri Lanka, where there is a dearth of research integrating several risk factors to examine their combined effect on financial performance. The study aims to close the empirical gap in previous research on the profitability of the banking industry in Sri Lanka by examining a wider range of factors in addition to credit risk.

1.4 Main Objective

To examine the impact of risk Management on the profitability of commercial Banks in Sri Lanka

1.5 Specific Objectives

1. To find the impact of credit risk management on the return on assets (ROA) & net interest margin (NIM) of banks in Sri Lanka.
2. To find the impact of liquidity risk management on the return on assets (ROA) & net interest margin (NIM) of banks in Sri Lanka.
3. To find the impact of bank capital management on the return on assets (ROA) & net interest margin (NIM) of banks in Sri Lanka.
4. To find the impact of operational risk management on the return on assets (ROA) & net interest margin (NIM) of banks in Sri Lanka.

1.6 Significance of the Research

By examining the impact of risk management on the profitability of Sri Lankan banks, with a particular emphasis on credit risk and common exposures, this study seeks to enhance the body of existing work. The results are highly relevant to investors, industry players, regulators, and bank managers. They also offer useful information that helps policymakers, shareholders, external investors, bank managers, and lenders make decisions. The study adds to the body of knowledge in this and related fields, which helps to address issues with efficient risk management in commercial banks.

2. LITERATURE REVIEW

With an emphasis on credit risk and common exposures, this study explores how risk management affects the profitability of banks in Sri Lanka. Its conclusions are important because they provide information that helps shareholders, bank management, legislators, regulators, and investors make well-informed decisions. By addressing issues with efficient risk management in commercial banks, the research advances our understanding of these and related fields. The purpose of this review of the literature is to investigate how risk management affects the financial profitability of Sri Lankan banks.

2.1 Theoretical Review

2.1.1 Credit Risk Management and Profitability

One of the most premier and significant categories of banking risk is credit risk (Colquitt, 2007). Credit risk management is the possibility that a contractual counterparty won't fulfill its obligations because of a reduction in the ability to pay or reluctance to uphold the terms of the agreement. Accordingly, credit risk manifests itself when a bank fails to recoup the money it lent to a borrower, counterparty, or oblige (Colquitt, 2007). According to Hempel and Simonson (1999) Credit risk is the possibility that the bank may not be able to collect the principal or interest on loans and securities as pledged.

Through efficient risk management, which includes a thorough credit risk analysis based on scanning and monitoring of the most reliable loan applications, the amount of collateral, diversification of the loan portfolio, and accurate loan pricing based on the borrower's repayment ability and intentions, banks are able to completely eliminate the credit risk. (Karim, 2006; Greuning and Bratanovic, 2009). A financial institution may suffer significant losses due to the default of a small number of borrowers, which might cause severe financial turmoil throughout the whole economy (Bessis, 2003).

2.1.2 Liquidity Risk Management and Profitability

According to Saunders and Cornett (2008), liquidity risk is the sudden increase in depositor withdrawals that could lead banks to quickly sell up their holdings. This risk, according to the State Bank of Pakistan (2003), is the possible loss brought on by a bank's failure to fulfil its obligations. In other words, liquidity risk results from unanticipated outflows of cash and the lack of enough liquidity to satisfy a bank's short-term obligations (Diamond & Rajan, 2005). As a result, banks run the danger

of not being able to fulfil their projected and unforeseen cash needs and borrow more money when necessary. On the other hand, liquidity risk also incites several financial risks such as market risk, interest rate risk, credit risk and strategic risk. For instance, liquidity risk provokes interest rate risk due to unknown rates of future funding and investment (Tahir, 2006). A sample of 25 Bangladeshi banks was observed by Rahman et al. (2015) between the years of 2003 and 2006. The findings showed a correlation between liquidity risk and bank performance that was positive, indicating that banks need to have more liquidity to operate more efficiently.

2.1.3 Bank Capital Management and Profitability

Based on Abdullahi (2013), Reorganizing banks' current capital structures is the beginning of capital, which will shield the banking sector from generalized hardship. Furthermore, the capital offers the chance to raise the bar in any business establishment. It divides up corporate effort and produces excellent results. As a result, capital encourages recapitalization when it seems to satisfy the needs of specific banks by raising the minimum paid-up capital, enabling banks to interact with consumers more effectively and efficiently. Also, Greater bank capital helps in maintaining financial stability. Also, it reduces financial distress on the banks (Berger & Bouwman, 2009).

According to Altunbas et al. (2007), the profitability of banking firms is also likely to have an impact on capital and risk. A positive relationship between capital and risk is referred to as the "regulatory hypothesis," which states that regulators encourage banks to increase their capital in proportion to the amount of risk they are taking. A negative relationship may be referred to as the "moral hazard hypothesis," which states that banks have incentives to take advantage of current flat deposit insurance schemes. Furthermore, Islam and Nishiyama (2016) examined a sample of 230 banks from four Southeast Asian countries, which prompted them to discover that equity capital has a positive influence on profitability.

2.1.4 Operational Risk Management and Profitability

Operational risk is defined as the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events. Further, Operational risk, according to the State Bank of Pakistan (2003), refers to the direct or indirect losses incurred by a banking organization as a result of inadequate or unsuccessful internal systems, processes, and personnel as well as from environmental factors on the outside. The likelihood of adverse effects on the bank's financial performance as well as its capital as a result of staff members' negligence, inadequate internal procedures, inadequate management information systems, or unpredictable and undesirable external events is related to operational risk, according to several other opinions.

To ensure the stability of the financial systems, the Basel Accord Committee has formulated three pillars which help to create an international standard that banking regulators can use when creating regulations about how much capital banks need to put aside to guard against the types of financial and operational risks banks face (Basel, 2004).

2.1.5 Determinants of Financial Performance

According to Silva (2009) and Yudistira (2004), all financial institutions and the financial sector that are active in an economy strive to operate effectively to achieve economic growth and financial system stability. Efficiency may be used to determine a company's or decision-making unit's performance level. Efficiency may be divided into three categories: more, equal, and less than real or projected efficiency level (Lovell, 1993). The current literature has placed a strong emphasis on the value of researching the effectiveness of Decision Making Units (DMU). The number of studies on bank efficiency has also increased recently. The risk variables should be considered jointly when analyzing bank efficiency since banks need to be both effective and secure. Because of this, the ideas of efficiency and risk are connected (Pastor, 2002).

ROA is regarded as the best indication of profitability by many authorities. The ROA reveals how much revenue the management can produce from the assets. As a result, ROA may be used to assess how well bank management turns assets into income (Goddard et al., 2004). According to Rivard and Thomas (1997), ROA is the most accurate indicator of bank profitability. This is because big equity multipliers do not influence ROA. The difference between net interest revenue and net interest costs relative to total assets is known as the net interest margin (NIM). The bank engages in both deposit collection and lending. It uses the money it receives from depositors at a lower interest rate to make loans to borrowers at a higher rate of interest. To calculate the NIM, we must subtract the net interest expenditure from the net interest income. If the asset quality is kept solid, a high NIM signals a stronger bank profitability performance.

2.2 Empirical Review

This survey of the literature examines risk management and highlights its importance in the wake of the world financial crisis. It highlights the importance of excellent risk management in boosting transparency, financial stability, and investor awareness of companies' risk policies and underlines the increased disclosure by banks on high-risk exposures. According to Esther (2016), risk management procedures need to be improved because they have a beneficial impact on the profit banks earn at any particular time. This study shows how crucial liquidity risk management is in affecting the income statements of Kenya's commercial banks, leading to the conclusion that managers who want to boost their company's earnings should keep an eye on anything that could affect the liquidity of their companies. More importantly, to increase profitability in situations of short-term debt, the loan percentage supplied by banks must be kept at a controllable level. This research got their Sample as The 14-year term was chosen based on Tarus and Omandi's (2013) business case of corporate governance, which stated that using five years would have resulted in a limited sample size and was therefore inappropriate for their analysis than five years.

Aboagye and Otieku, (2010) conducted a study on Credit Risk Management and Profitability in financial institutions in Sweden. The major goal was to determine whether managing credit risk has an impact on the financial institution's capacity to make money. They discovered that Basel II's implementation as well as the current

global financial crisis have increased the importance of credit risk management in financial institutions. Adeusi & Stephen Oluwafemi, (2014) found that there is a strong connection between risk management and bank performance. higher risk management through managed funds, lower costs for doubtful and bad loans, and a lower Debt equity ratio lead to higher bank performance. Therefore, banks must engage in responsible risk management preserve bank assets and defend the interests of investors 10 Nigerian banks were the subject of annual observations for this study between 2006 and 2009. Maaka, (2013) carried out a study to investigate the liquidity faced by commercial banks in Kenya and to establish the relationship between liquidity risk and the performance of banks in Kenya. The research findings established that profitability was negatively affected due to the increase in liquidity gap and leverage. The level of customer deposits was found to positively affect the bank's profitability.

3. RESEARCH METHODOLOGY

3.1 Research Design

3.1.1 Research Philosophy

Research philosophy refers to the beliefs and assumptions that underpin the researcher's approach to knowledge and understanding. The positivist philosophy is adopted for this research because this study's reality is dependent on only one truth.

3.1.2 Research Logic

Research logic refers to the logical framework and reasoning that guides the research process. quantitative research. Accordingly, this research is associated with the deductive method. This study goes from general to specific (Top-down approach).

3.1.3 Research Approach

This research is also associated with the quantitative approach because this research is positivist and deductive. This research works with statistics or numbers and tries to do theory testing by using secondary data from annual reports of banks.

3.2 Conceptual Framework

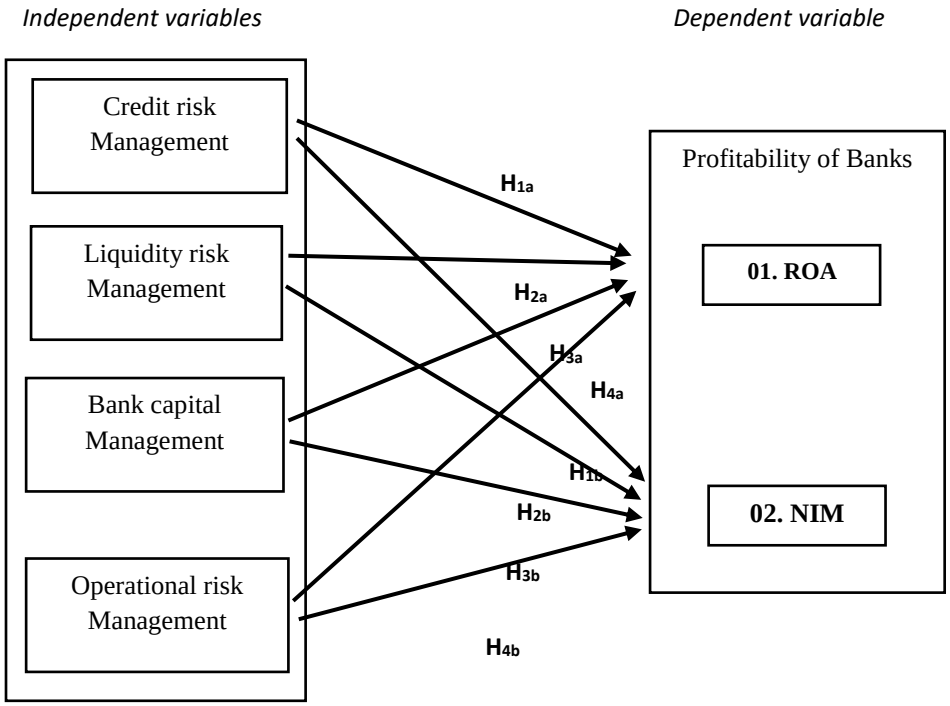

Figure 1: Conceptual Framework

3.3 Operationalization

Table 1: Operationalization Table

Construct	Variable	Measurement	Source
Independent Variables			
	Credit Risk Management	$\frac{\text{Loan Loss Provison}}{\text{Total Loan}}$	Githaiga (2013)
Bank Specific Risk Measures	Liquidity Risk Management	$\frac{\text{Liquidity Assets}}{\text{Total Assets}}$	Olalekan et al (2019)
	Bank Capital Management	$\frac{\text{Equity}}{\text{Total Assets}}$	Isam & Malik Abu (2020)
	Operational Risk Management	$\frac{\text{Operating Income}}{\text{Operating Expenses}}$	Piyananda, Chandrasena & Fernando (2015)

Dependent Variable			
Risk Management Outcome	Return on Assets (ROA)	$\frac{\text{Net income}}{\text{Total assets}}$	Olalekan et al (2019) & Isam & Malik Abu (2020)
	Net Interest Margin	$\frac{Interest\ income - Interest\ expense}{Total\ Assets}$	Prem et al (2020) & San & Heng (2013)

3.4 Population and Sample Selection

The target population for this study was the 24 commercial banks listed in the Central Bank of Sri Lanka (CBSL) as of December 2022. Research represents the entire commercial banks listed in the Central Bank of Sri Lanka (CBSL) as the population. The scope of this research study is limited to 10 Commercial Banks out of 24 LCBs as the sample selected. The argument based on the highest market capitalization. Data is collected for 10 years from 2013-2022. The purposive sampling method is used to select 10 commercial banks that have been listed in the Colombo Stock Exchange (CSE).

3.5 Data collection method

This study is conducted based on secondary data for the period of 10 years (2013 to 2022) to examine the hypothesis defined by the researcher.

3.6 Analysis of Data

The data collected from the annual reports of the banks were analyzed using multiple regression analysis the relation of one dependent variable to multiple independent variables. Then the data was analyzed by the use of Descriptive statistics using STATA.

3.7 Hypotheses Development

H_{1a}: There is a significant impact of credit risk on a bank's return on assets (ROA).
H_{1b}: There is a significant impact of credit risk on a bank's net interest margin (NIM).

H_{2a}: There is a significant impact of liquidity risk on a bank's return on assets (ROA).
H_{2b}: There is a significant impact of liquidity risk on the bank's net interest margin (NIM).

H_{3a}: There is a significant impact of bank capital on the bank's return on assets (ROA).
H_{3b}: There is a significant impact of bank capital on the bank's net interest margin (NIM).

H_{4a}: There is a significant impact of operational risk on the bank's return on assets (ROA).

H_{4b}: There is a significant impact of operational risk on the bank's net interest margin (NIM).

4. ANALYSIS AND DISCUSSION

Descriptive statistics and regression analysis are used as the analytical tools of this study. Finally, this chapter includes the discussion part concerning findings and the results of subjected study.

4.1 Findings

Descriptive Statistics

Table 2: Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
ROA	100	.01	.004	.004	.016	-.143	1.78
NIM	100	.037	.006	.029	.047	.282	1.837
CR	100	.011	.007	.003	.024	.541	2.018
LR	100	.065	.014	.048	.084	.247	1.606
BC	100	.102	.027	.074	.154	.862	2.43
OR	100	2.175	.511	1.43	3.106	.387	2.148

Note: ROA, Return on Assets; NIM, Net Interest Margin; CR, Credit Risk; LR, Liquidity Risk; BC, Bank Capital; OR, Operational Risk
Source: STATA Software

Table 2 above summarizes the descriptive statistics of the variables included in the regression models as presented. It represents the variables of 10 Commercial Banks operating in Sri Lanka whose financial results were available for the years 2013-2022. The average value of ROA of the 10 selected listed commercial banks mean stood at 0.01, while the minimum stood at 0.004 and the maximum was 0.016. The average value of NIM of the 10 selected listed commercial banks mean stood at 0.037, while the minimum stood at 0.029 and the maximum was 0.047. The provided descriptive statistics offer valuable insights into six key financial variables within a dataset consisting of 100 observations. The mean value of the Credit risk (CR) for the selected sample was 0.011, while 0.003 was the minimum and 0.024 was the maximum. The mean value of the Liquidity risk (LR) for the selected sample was 0.065, while 0.048 was the minimum and 0.084 was the maximum. The mean value of the Bank capital (BC) for the selected sample was 0.102, while 0.074 was the minimum and 0.154 was the maximum. The mean value of the Operating risk (OR) for the selected sample was 2.175, while 1.43 was the minimum and 3.106 was the maximum. These statistics provide an initial understanding of the data's central tendencies, spread, and shape of the distributions for these variables.

4.2 Diagnostic Tests

4.2.1 Normality

The normality test helps to determine how likely it is for a random variable underlying the data set to be normally distributed. All dependent and independent variables' skeweness values are not beyond ± 2 and kurtosis values are not more than 5. The data set is normally distributed.

4.2.2 Serial Autocorrelation

Table 3: Wooldridge Test for Autocorrelation

Wooldridge test for autocorrelation in panel data	**ROA**	**NIM**
H0: no first-order autocorrelation		
F(1, 9)	1.869	3.490
Prob > F	0.2087	0.0985

Source: STATA Software

Since the p-value (0.2087) is greater than the typical significance level of 0.05, we do not have enough evidence to reject the null hypothesis. Therefore, we do not have strong evidence to suggest the presence of first-order autocorrelation in this panel data based on the Wooldridge test.

Since the p-value (0.0985) is greater than the typical significance level of 0.05. Still, we have no strong evidence that suggests the presence of first-order autocorrelation in the data set based on the Wooldridge test.

4.2.3 Stationarity

Table 4: Levin-Lin-Chu Unit-Root Test for Stationarity

Ho: Panels contain unit roots

Ha: Panels are stationary

Variables	**Unadjusted t**	**Adjusted t***	**p-value**
ROA	-9.5323	-4.3782	0.0000
NIM	-12.2230	-7.5324	0.0000
CR	-8.0659	-5.0657	0.0000
LR	-9.5511	-2.9163	0.0018
BC	-10.5623	-6.8259	0.0000
OR	-9.4318	-3.7729	0.0001

Source: STATA Software

The Levin-Lin-Chu unit root test results suggest strong evidence that variables such as ROA, NIM, CR, LR, BC and OR are likely stationary. This conclusion is supported

by low p-values, indicating a lack of a unit root. While LR also shows evidence of stationarity, the support is somewhat weaker compared to the other variables. The unadjusted t-statistics of all variables suggest that there may be evidence of stationarity, as it is significantly different from zero in the negative direction and assumes a typical significance level of 0.05.

4.2.4 Test for Multicollinearity

Multicollinearity is a statistical issue that occurs when two or more independent variables in a regression model are highly correlated with each other. It can cause problems in regression analysis, including unstable coefficient estimates, reduced statistical significance, and difficulties in interpreting the effect of individual predictors.

The VIF quantifies the extent to which the variance of an estimated regression coefficient is increased due to multicollinearity. Calculate the VIF for each independent variable. VIF values greater than 10 in a large sample suggest multicollinearity, with higher values indicating more severe multicollinearity. VIF is calculated as follows.

Table 5: VIF Test

Variable	VIF	1/VIF
Operational Risk	1.42	0.706546
Credit Risk	1.34	0.746911
Bank Capital	1.09	0.918297
Liquidity Risk	1.00	0.995599
Mean VIF	1.21	

Source: STATA Software

If VIF is greater than 10 in a large sample, then multicollinearity could exist in the variables. Above table 4.4 shows result for regression VIF is lower than 10 in model, then there is no multicollinearity.

4.3 Regression Analysis for ROA

The dependent variable (ROA) and independent variables are mathematically examined in this study using regression analysis, which yields regression estimates of coefficient values that are displayed in a coefficient table. Both fixed effect and random effect models are included in the analysis; the researcher uses a Hausman test to choose which model best fits the goal of the investigation.

4.3.1 Fixed effect Model Regression

Table 6: Fixed Effect Model Regression

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	-.366	.04	-9.22	0	-.444	-.287	***
LR	-.026	.02	-1.29	.199	-.067	.014	
BC	.036	.017	2.19	.031	.003	.069	**
OR	.005	.001	6.53	0	.004	.007	***
Constant	.001	.002	0.28	.781	-.004	.005	

Mean dependent var	0.010	SD dependent var	0.004
R-squared	0.561	Number of obs	100
F-test	27.527	Prob > F	0.000
Akaike crit. (AIC)	-977.894	Bayesian crit. (BIC)	-964.868

*** p<.01, ** p<.05, * p<.1 Notes: ROA, Return on Assets; NIM, Net Interest Margin; CR, Credit Risk; LR, Liquidity Risk; BC, Bank Capital; OR, Operational Risk
(Source: STATA Software)

According to the results of the research study, the overall value of R -squared in table 4.5 is 0.561, which indicates that the four variables in the fixed effect model explain about 56.1% of the Return on Assets. The findings indicate that while Bank Capital and Operational Risk both statically significantly influence ROA, Credit Risk significantly and negatively influences ROA while Liquidity Risk does not reach statistical significance. The F-statistic of 27.527 with a p-value of 0.000 suggests that the overall model (with all independent variables) is statistically significant.

4.3.2 Random Effect Model Regression

Table 7: Random Effect Model Regression

ROA	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	-.379	.039	-9.65	0	-.455	-.302	***
LR	-.04	.02	-2.02	.043	-.079	-.001	**
BC	.007	.014	0.52	.604	-.02	.035	
OR	.006	.001	8.10	0	.004	.007	***
Constant	.003	.002	1.42	.155	-.001	.008	

Mean dependent var	0.010	SD dependent var	0.004
Overall r-squared	0.432	Number of obs	100
Chi-square	104.167	Prob > chi2	0.000
R-squared within	0.546	R-squared between	0.351

*** p<.01, ** p<.05, * p<.1 Notes: ROA, Return on Assets; NIM, Net Interest Margin; CR, Credit Risk; LR, Liquidity Risk; BC, Bank Capital; OR, Operational Risk

Source: STATA Software

The results of Table 4.6 show that the overall R-squared value is 0.432, which means that the independent variables collectively explain 43.2% of the variation in ROA. This indicates a moderate level of explanatory power. The results of the study show that while operational risk has a substantial positive link with ROA, credit risk has a considerable negative impact on ROA. At the 1% level, operational risk and credit risk are both statistically significant. Even at the 5% threshold of statistical significance, liquidity risk has a negative impact on return on assets (ROA). Bank Capital, on the other hand, does not demonstrate a discernible effect on ROA. The Chi-square statistic is 104.167, and the associated p-value is 0.000, indicating that the model as a whole is statistically significant.

4.3.3 Hausman Specification Test

Table 8: Hausman Specification Test for ROA

	Coef.
Chi-square test value	12.791
P-value	.012

Hausman test results show a 0.0123 probability value at a 95% significant level where the null hypothesis is rejected. According to that random effect, the model is rejected, and the fixed effect model is selected as the best-fitted model for the study. Therefore, the results of the fixed effect model are discussed in the data analysis.

4.3.4 Testing for fixed effects - To run F test

Table 9: Testing for Fixed Effects for ROA

test CreditRisk LiquidityRisk BankCapital OperationalRisk
F(4, 86) = 27.53
Prob > F = 0.0000

Source: STATA Software

According to the result of the F- the p-value was 0.0000. So according to the OLS model is rejected. And the Fixed effect is accepted as the best-fit model for the study. F-test values come to 27.53 with a probability of F = 0.0000 indicating that the fixed effect model is better than the pooled OLS model. Therefore, the results of the fixed effect model are discussed in the data analysis.

4.4 Regression Analysis for NIM

4.4.1 Fixed effect Model Regression

Table 10: Fixed Effect Model Regression

NIM	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	-.087	.089	-0.00	.999	-.177	.176	
LR	.059	.046	1.29	.199	-.032	.15	
BC	.055	.037	1.47	.145	-.019	.128	
OR	.005	.002	2.99	.004	.002	.009	***
Constant	.016	.005	3.23	.002	.006	.026	***

Mean dependent var	0.037	SD dependent var	0.006
R-squared	0.256	Number of obs	100
F-test	7.403	Prob > F	0.000
Akaike crit. (AIC)	-816.713	Bayesian crit. (BIC)	-803.687

*** p<.01, ** p<.05, * p<.1 Notes: ROA, Return on Assets; NIM, Net Interest Margin; CR, Credit Risk; LR, Liquidity Risk; BC, Bank Capital; OR, Operational Risk
(Source: STATA Software)

According to the regression results, bank capital, liquidity risk, and credit risk do not statistically significantly affect the dependent variable (net interest margin) in a fixed-effect model. Operational risk, however, has a very favourable effect. With an approximate explanation of 25.6% of the variance in the dependent variable, the whole model is statistically significant. The overall model is statistically significant at a 5% level, as indicated by the F-test, and it explains approximately 25.6% of the variance in the dependent variable.

4.4.2 Random Effect Model Regression

Table 11: Random Effect Model Regression

NIM	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CR	.019	.084	0.23	.818	-.146	.185	
LR	.05	.043	1.18	.238	-.033	.134	
BC	.042	.031	1.35	.178	-.019	.103	
OR	.005	.002	3.15	.002	.002	.008	***
Constant	.019	.005	3.80	0	.009	.028	***

Mean dependent var	0.037	SD dependent var	0.006
Overall r-squared	0.037	Number of obs	100
Chi-square	26.684	Prob > chi2	0.000
R-squared within	0.255	R-squared between	0.088

*** p<.01, ** p<.05, * p<.1 Notes: ROA, Return on Assets; NIM, Net Interest Margin; CR, Credit Risk; LR, Liquidity Risk; BC, Bank Capital; OR, Operational Risk
(Source: STATA Software)

Credit risk, liquidity risk, and bank capital do not show statistically significant impacts on the dependent variable (net interest margin) in the random effects regression model. On the other hand, operational risk shows a notable benefit. The overall R-squared value is 0.037, indicating that only 3.7% of the variance in the dependent variable is explained by the independent variables in the model. The chi-square statistic is 26.684 with a p-value of 0.000, suggesting that the overall model is statistically significant at a 5% level. In summary, research can conclude that operational risk has a significant positive impact on the dependent variable, while credit risk, liquidity risk, and bank capital do not appear to have statistically significant effects. The overall model is statistically significant, as indicated by the chi-square test, but it explains only a small proportion (3.7%) of the variance in the dependent variable.

4.4.3 Hausman Specification Test

Table 12: Hausman Specification Test for NIM

	Coef.
Chi-square test value	4.558
P-value	.336

Source: STATA Software

The Hausman test yields insufficient evidence to reject the null hypothesis, as indicated by its chi-square test result of 4.558 and p-value of 0.336. As such, the fixed-effects model does not have enough statistical support to be preferred over the random-effects model. As a result, the study continues using the random-effects model's results.

4.4.4 Testing for Random Effects: Breusch-Pagan Lagrange Multiplier

Breusch and Pagan Lagrangian multiplier test for random effects

NIM[Bank,t] = Xb + u[Bank] + e[Bank,t]

Table 13: Estimated Results

	Var	**sd = sqrt(Var)**
NIM	.0000362	.0060152
e	.0000175	.0041815
u	.000022	.0046891

Test: Var(u) = 0

chibar2(01) = 70.86

Prob > chibar2 =0.0000

Source: STATA Software

According to the result of LM test p-value was 0.0000. So according to OLS model is rejected. And the random effect is selected as the best fit model for the study. Therefore, the results of the random effect are discussed in the data analysis.

4.5 Mathematical Model

$$ROA_{it} = \alpha + B_1X_1 + B_1X_2 + B_1X_3 + B_1X_4 + U_i$$

*ROA = 0.001 -0.366*Credit Risk -0.026*Liquidity Risk +0.036*Bank Capital +0.005* Operational Risk* + Ɛ

Table 4.5 also shows that the relation between the Return on Asset (ROA) and independent variables (Credit Risk, Liquidity Risk, Bank Capital, Operational Risk) are F-test (27.527) tests the overall significance of the model 0.05 level. According to Table 4.2, we can drive the above mathematical function for (ROA)model. (ROA)model.

$$NIM_{it} = \alpha + B_1X_1 + B_1X_2 + B_1X_3 + B_1X_4 + U_i$$

*NIM = 0.019 + 0. 019*Credit Risk + 0.05*Liquidity Risk + 0.042*Bank Capital + 0. 005* Operational Risk* + Ɛ

Table 4.10 also shows that the relation between the Net Interest Margin (NIM) and independent variables (Credit Risk, Liquidity Risk, Bank Capital, Operational Risk) chi-square statistic (26.684) tests the overall significance of the model. The low p-value ($p < 0.05$) indicates that the model is statistically significant. R-squared within (0.255) and R-squared between (0.088) provide information on the proportion of variance explained by fixed effects and random effects, respectively. According to Table 4.7, we can drive the above mathematical function for (NIM) model.

4.6 Hypothesis Testing

Table 14: Hypothesis Testing

Hypothesis	**Regression Analysis**		
	Outcome	**Coef.**	**P-Value**
H_{1a}: There is a significant impact of credit risk on ROA.	Accepted	-0.366	0
H_{2a}: There is a significant impact of liquidity risk on ROA.	Rejected	-0.026	0.199
H_{3a}: There is a significant impact of bank capital on ROA.	Accepted	0.036	0.031

H_{4a}: There is a significant impact of operational risk on ROA.	Accepted	0.005	0
H_{1b}: There is a significant impact of credit risk on NIM.	Rejected	0.019	0.818
H_{2b}: There is a significant impact of liquidity risk on NIM.	Rejected	0.05	0.238
H_{3b}: There is a significant impact of bank capital on NIM.	Rejected	0.042	0.178
H_{4b}: There is a significant impact of operational risk on NIM.	Accepted	0.005	0.002

Source: STATA Software

This chapter especially gives attention to data Presentation and Analysis using the multiple analysis approaches. This chapter discusses several major analyses of this study according to the impact of Risk Management on the Profitability of Banks in Sri Lanka for the period from 2013 to 2022. According to the results analysis and discussion of the chapter, the hypothesis has been tested. It denotes the relevancy and consistency of the study with prior studies and the theories relating to this field.

The two dependant variables show different results for ROA & NIM.Out of four dimestions for ROA accepted only three; whereas for NIM one accepted out of four hypothseses. Therefore, the for Sri Lankan context more viable measurement is comparatively ROA as per the study to measure risk management for licensed banks. Accordingly, the section will summarize and interpret the conclusions and recommendations.

5. CONCLUSION

The main conclusions of the study about how risk management affects the profitability of Sri Lanka's listed commercial banks are succinctly summarized in this chapter. It outlines the conclusions and suggestions drawn from the data and points out areas that might be the subject of further study.

The discussion of this research draws from its objective as stated in Chapter One and the study's findings as discussed in Chapter Four. The objective of the study is to examine whether risk management would have an impact on the profitability of listed commercial banks in Sri Lanka. From the analysis, the overall outcome reveals that risk management should have an impact on the returns that banks make in any given period.

According to the study, there is a significant impact between credit risk management and bank profitability measured variables. Bank management can increase bank profitability through various aspects by adopting credit risk management policies.. This study highlights the significance of managing liquidity risk concerning the income statement of commercial banks operating in Sri Lanka. Consequently, managers who aim to enhance their organization's earnings should closely monitor

any factors that may impact their firm's liquidity. More importantly, the loan proportion given by banks needs to be maintained at a manageable level to boost profitability in cases of shortfalls. This is to say that banks need to be watchful of the way they issue long-term to their customers since a properly managed credit level of risk will for sure yield more returns to the firm.

According to the study, bank capital and bank profitability show a significant impact between the measured variables. Therefore, it is possible to approve the Null hypothesis (H_3). High-capitalised bank can gable more business opportunities. It is able and flexible in handling the risk and lowers the risk of going insolvent which will reduce the need for borrowing and subsequently increase bank profitability. Further, the study leads to a conclusion that the null hypothesis is there is a significant impact between the operational risk management and banks profit (ROA/NIM) should be accepted since the results have demonstrated the importance and positivity of the relationship between the two variables. Banks that want to achieve large and increased returns on their assets and investments should be concerned about the critical examination of overhead items. Since this is the main objective of shareholders in all businesses, banks are left with little choice but to make sure that operational efficiency is upheld, and associated risk is controlled to a reasonable degree.

Among these two models, the ROA model generates the highest R square, 0.561, which means that 56.1% of the variance in ROA is explained by the four independent variables considered in this paper. The NIM model generates the lower R squares. The R square for the NIM model is 0.256. For the NIM model, the independent variables explain 25.6% of NIM. From the analysis, it is concluded that the ROA model is the most reliable model among the two profitability measures. The ROA model provided the highest R square and it is better explained by bank-specific risk variables that were employed in our analysis. According to Rivard and Thomas (1997) and Golin (2001), they found that ROA is the best measurement of bank profitability as compared to ROE and NIM.

5.2 Recommendations

It is clear from the examination of how risk management affects Sri Lankan banks' profitability that these institutions' financial performance is significantly influenced by their use of efficient risk management techniques. We suggest that Sri Lankan banks concentrate on improving their risk management methods considering our findings, especially about credit risk and liquidity risk, as these were found to be significant variables adversely affecting net interest margin and return on assets. Moreover, it is necessary to sustain a substantial amount of bank capital to enhance profitability. Return on assets can also be positively impacted by giving good operational risk management top priority. To strengthen their financial stability, and to implore banks to invest in strong risk assessment, monitoring, and mitigation systems. Make suggestions to Sri Lankan banks on how to raise profitability and strengthen risk management procedures considering your findings. The given suggestions provide a direction for Sri Lankan banks success and remain sustainable over the long run in a fast-paced and cutthroat financial market.

5.3 Suggestions for Further Research

The study suggests that a further study can be done on the impact of Risk Management on Financial Performance of indicators on the financial performance of other financial institutions like the microfinance institutions (MFIs) and financial institutions (FI)s. This is to ascertain if the model can be applied as a proxy for risk management on the other financial institutions in the Sri Lankan market. Further studies can also be undertaken on risk management practices followed by commercial. The study can comprise data collected through both, primary as well as secondary sources to use primary source data to check the extent to which different risk management practices have been followed by commercial banks through the use of questionnaires.

5.4 Limitations of the Study

The primary limitation in this study is that the data collection focused on only one sector in one country and there is a relatively narrow ten-year period for the data collection. This study analyses the ten years and 10 banks' impact on risk disclosure on the listed commercial banks. Future researchers can study the long-run effect when using the twenty years of data. However, this study provides future opportunities for extending similar research on different business sectors and different countries with similar financial and banking sectors. Since there are additional variables affecting ROA and NIM with the same level of prediction, there may be more independent variables than four.

This study only included ten listed commercial banks in Sri Lanka and in this study, government commercial banks are not included because those banks are not listed. It is possible that the market conditions and distinctive features of the Sri Lankan banking sector are not well represented by conventional risk and financial performance metrics. These ought to be taken into account during analysis.

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COMPARATIVE STUDY ON CUSTOMER EXPERIENCE IN DIGITAL BANKING AND PHYSICAL BANKING IN SRI LANKA: A SPECIAL REFERENCE TO SRI LANKAN COMMERCIAL BANKS

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Abstract

With the increasing adoption of digital banking in Sri Lanka, the convenience and accessibility of online platforms have transformed how customers manage their financial activities. However, customer experiences across digital banking channels may vary considerably from those in traditional, physical bank branches. This study aims to explore the customer experience within Sri Lankan commercial banks, focusing on both digital and physical banking channels. The key research problem involves understanding customer performances and expectations while evaluating the effectiveness of these banking channels. This research seeks to provide actionable insights for the improvement of service delivery. The study specifically investigates customer experiences in terms of perceived ease of use, efficiency, control, and security, while considering the consistency of service quality and the emotional responses of the customers. The primary objectives are to compare the customer experience in digital verses physical banking channels, and to assess the influence of demographic factors, such as age, gender, income, marital status, province, and employment sector, on the choice of banking channels. A comparative quantitative analysis was conducted, utilizing demographic factors and customer variables drawn from existing literature. Two models were developed to analyse customer preferences: one for digital banking and one for physical branch banking, with outcomes categorized as 'indifferent', 'prefer digital', or 'prefer both'. The hypotheses were tested using probit regression analysis. The findings revealed that level of education significantly affects the performance for digital banking, with perceived control and security being critical factors influencing digital banking experiences. For physical bank branches, customer age, education level, and income were found to be significant predictors of preference. Based on the analysis, this study provides policy recommendations aimed at enhancing customer experience and satisfaction in Sri Lanka commercial banks by aligning service delivery with customer expectations across both banking platforms.

Keywords: Customer Experience, Customer Satisfaction, Digital Banking, Demographic Factors Physical Banking

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1. INTRODUCTION

1.1 Background of the Study

Digitalization in banking has been a topic of interest for decades and remains relevant, especially with the rise of digital banking platforms. Major study areas globally include digital banking adoption, customer satisfaction, and factors influencing digital banking. However, research on these topics in Sri Lanka remains limited, particularly in customer experience across multiple banking channels. A review by Chauhan, Akhtar, and Gupta (2022) highlighted that while customer experiences with digital banking have been well-researched, studies in Sri Lanka, particularly comparing digital and physical banking, where absent from their selection of 88 global articles. This indicates a gap in Sri Lankan research, which this study aims to address.

In Sri Lanka, customer experience in banking has the potential to extend beyond digital banking. The question arises whether customers experience similar levels of satisfaction across different banking channels- digital and physical. Given Sri Lanka's ongoing technological development and varying levels of digital literacy, it is crucial to compare customer experiences between these two major channels: digital banking and physical bank branches. The global banking industry is rapidly evolving, with multiple channels available for customer interaction, including ATMs, phone banking, mobile banking, and digital wallets. Despite these advancements, Sri Lankan customers have been slower to shift entirely to digital banking. Banks in Sri Lanka need to ensure that customer service is consistent across all channels to meet customer expectations, increase satisfaction, and remain competitive.

In Sri Lanka, digital banking adoption is still a work in progress, with varying degrees of technology acceptance and digital literacy. As banks interact with customers through multiple channels such as physical branches, ATMs, and phone banking, understanding how customer experiences differ across these platforms is crucial. While global studies have largely focused on digital banking, Sri Lankan banks must ensure that they offer consistent, high-quality service across all channels, not just digital platforms. Customer preferences vary significantly. While some customers may prefer the speed and convenience of mobile banking, others value the personal interaction offered by physical branches. Understanding the customer experience across these diverse channels can provide banks with valuable insights to optimize their service offerings. This study focuses on customer satisfaction and behaviour across Sri Lanka's digital and physical banking channels, considering demographic factors such as age, income, education, and location, which can influence preferences.

The importance of understanding customer preferences and expectations across various channels cannot be overstated. By analysing customer behaviour, banks can make more informed investment decisions and optimize their services to improve customer satisfaction and loyalty. Digital banking channels may be suitable for quick, simple transactions, while physical branches offer personalized in-depth service for more complex needs. By integrating these channels and providing a seamless

customer experience, banks can increase customer loyalty, reduce operational costs, and improve overall efficiency.

Although digital banking is expanding in Sri Lanka, it has not yet reached the same level of penetration seen in other countries. According to the Central Bank of Sri Lanka's Payment Bulletin (2023), mobile banking adoption is increasing, driven by government initiatives and affordable smartphones. However, the use of internet banking remains low due to limited digital literacy and unreliable internet connections in some areas.

Sri Lankan banks are still heavily reliant on physical branches, particularly in rural areas. While there is a growing trend toward digital banking particularly among younger, urban populations, physical branches remain vital for older and rural customers. These customers often require in-person consultations for more complex transactions or financial advice, highlighting the need for a balanced approach to customer service. The study also considers how demographic factors, such as age, gender, location, education level, and socio-economic status, affect customer performances and satisfaction with different banking channels.

Emerging banking channels, such as AI- powered chatbots, social media banking, and voice banking, are still uncommon in Sri Lanka, further emphasizing the need for a comprehensive comparison between traditional and digital channels. Balancing these channels is crucial as customer preferences evolve. For instance, customers may start a transaction online but require assistance from a branch for completion. This hybrid approach calls for a seamless, integrated banking experience that aligns with the diverse needs of Sri Lanka's population.

The research problem of the study is how customer experiences and satisfaction differ between digital banking and physical branch banking in Sri Lanka. As more customers shift toward digital platforms for convenience, it raises questions about whether digital channels consistently offer a better experience compared to traditional bank branches, if a combination of both is the most effective strategy. The study also seeks to address potential customer complaints, and challenges. The goal is to identify the best approach for delivering a high-quality banking experience in the context of Sri Lanka's evolving banking landscape.

This study will conduct a comparative analysis of customer experience across digital and physical banking channels in Sri Lanka. Ultimately, this study aims to provide valuable insights into the way that Sri Lankan banks can improve customer experience across all channels. By optimizing resource allocation and streamlining internal processes, banks can reduce costs, increase efficiency, and offer a more unified customer experience. This will allow banks to build stronger relationships with their customers, increase profitability, and stay competitive in an increasingly digital financial landscape. The findings will help identify the strengths and weaknesses of each channel and provide insights for banks to better service their customers. Customer satisfaction is influenced by various factors, including ease of use, efficiency, control, and security across different platforms. By analysing these

factors, banks can address customer complaints such as long waiting times at branches or confusing digital interfaces and improve the overall customer experience.

2. LITERATURE REVIEW

2.1 Conceptual and Theoretical Review

The Technology Acceptance Model (TAM) is one of the most widely used frameworks to understand how user come to adopt and interact with new technologies. It was created to explain the factors that determine technology acceptance, focusing on the user's attitude towards using a particular system. The model has two critical components: perceived usefulness this refers to the degree to which a person believes that using a particular technology will enhance their job performance and perceived ease of use component measures how effortless the technology appears to be. If users feel that a new system is easy to learn and navigate, they are more likely to embrace it. Conversely, if a system seems complex, requires extensive training, or is cumbersome, people will be more reluctant to adopt it, even if they believe it is useful.

Customer Experience (CX) in digital banking are grounded in service quality theories and consumer behaviour research. One of the most influential models in understanding customer experience is the SERVQUAL model developed by Parasuraman, Zeithaml, and Berry in 1985. This model was later adapted for the digital space to measure and analyse online service quality. CX in digital banking is the holistic perception that customers form based their interactions with a bank through digital channels such as mobile apps, websites, and online services. Research in this area often uses models like SERVQUAL (Service Quality) to measure in effectiveness of service delivery and customer satisfaction. It identifies five dimensions of service quality that contribute to the customer experience:

1. Tangibility: the physical appearance of facilities, equipment, and materials.
2. Reliability: the ability to provide dependable, consistence service.
3. Responsiveness: willingness to help customers promptly.
4. Assurance: employees' knowledge and their ability to install trust and confidence.
5. Empathy: the provision of caring, personalized attention.

In digital banking, these dimensions are modified to address virtual interactions, focusing more on reliability, responsiveness, security, and privacy in context of online platforms.

2.1.1 Multi-Channel and Omni-Channel Theories

The multi-channel and omni-channel models in banking are derived from theories in channel integration and customer journey management these theories highlight how customers interact with brands through various touchpoints and how seamless integration across these touchpoints leads to a better overall experience.

2.1.1.1 Multi-channel integration: a multi-channel approach emphasizes the availability of different banking services but treats each as a distinct entity. The theoretical backgro.und here is grounded in the customer decision-making progress, which is influenced by convenience, availability, and cost.

2.1.1.2 Omni-channel: banking expands on the multi-channel concept by integrating these services into a unified experience. It draws on relationship marketing theories, focusing on creating consistent, long-term interactions with customers through seamless transitions between channels.

2.1.2 Customer Experience Management (CEM) in Banking

The CEM model used in banking is based on relationship marketing and customer satisfaction theories. It focuses on managing the overall experience across various stages of the customer journey, ensuring that banks meet or exceed customer expectations at each touchpoint. This approach integrates concepts from,

1. Expectation-Confirmation Theory (ECT) proposed by Oliver in 1980, ECT suggests that satisfaction is based on the comparison between expected performance and actual performance. If actual performance exceeds expectations, satisfaction and loyalty increase.
2. Customer Journey Mapping is a concept which is grounded in service design and user experience design theory, which emphasizes mapping every interaction a customer has with a business, identifying pain points, and creating strategies for improvement.

On the other hand, there are factors which influence CX in banking such as functional and emotional drivers of customer satisfaction:

1. Functional aspects such as reliability, responsiveness, security, and privacy are essential for ensuring that banking services work effectively.
2. Emotional aspects like employee competence, communication, and physical environment are key to shaping customer perceptions and satisfaction. These are tied to theories of emotional labour and service recovery, which highlight the role of human interaction and organizational support in shaping the customer experience.
3. Brand reputation and trust are fundamental elements from brand equity theory where a well-established and trusted brand leads to higher customer loyalty and a better overall experience.

Furthermore, there are models for measuring CX such as service quality model, customer mapping and net promoter score.

1. Service quality model: as mentioned, SERVQUAL is a prominent model for digital environments to measure quality in the banking sector. It focuses on narrowing the gap between customer expectations and the actual service delivered.

2. Customer journey mapping: this method is grounded in experience-based design theory and focuses on understanding the entire customer lifecycle, from first contact to ongoing engagement. It is useful in identifying areas where customer expectations are unmet and improving those areas.
3. Net promoter score developed by Reichheld in 2003, is a metric based on customer loyalty theory. It asks customers how likely they are to recommend a company's services to other. It is valuable for banking institutions as it provides a straightforward measure of customer satisfaction and protentional loyalty, which is key in long-term relationship management.

2.2 Empirical Review

The literature review examines the role of various banking channels-both traditional and digital influencing customer relationships, operational dynamics, and strategic decision-making within the banking industry. Digital banking, particularly internet and mobile banking, has seen significant growth due to its convenience and efficiency, allowing customers to conduct transactions without needing to visit physical branches. The adoption of these digital channels is driven by factors like technological innovation, trust, and ease of use (Venkatesh et al.,2003). However, security concerns and demographic factors such as age and technical expertise still affect adoption rates (Anggraeni, Hapsari & Muslim, 2021).

Despite the rise of digital banking, traditional branch banking remains important, especially for complex transactions and customers in rural areas who prefer in-person interactions. The review notes that while branch usage is decreasing due to the convenience of digital channels, physical branches are crucial for building trust and customer relationship (Hawkins & Mihaljek, 2001). Moreover, Integrated Banking Channel Service Quality (IBCSQ) is essential in shaping customer satisfaction, perceptions, and loyalty toward banks (Aswani et al., 2018).

In Sri Lanka, digital banking is gaining momentum but faces challenges related to low adoption rates due to limited internet access and security concerns, particularly outside major urban centres (Daniel, 1999). Mobile banking, internet banking, ATMs, and agent banking have all contributed to improving financial inclusion and customer convenience, especially in underserved regions (Balkan, 2021). Furthermore, social media banking is emerging as a potential channel to enhance customer engagement and loyalty, though issues of privacy and security require further research (Anggraeni, Hapsari & Muslim, 2021).

The literature underscores the importance of a multichannel strategy, allowing customers to choose between digital and traditional channels based on their preferences and transaction complexity (Epstein, 2015). Banks that offer an omnichannel experience can better meet customer needs, thereby enhancing satisfaction and trust. Overall, the review highlights that while digital banking is rapidly growing, traditional banking methods remain relevant, particularly in specific demographic segments and rural areas.

Recent studies on digital banking have identified several factors influencing customer satisfaction, loyalty, and adoption. In Iran, Ashrafpour et al. (2021) found that customer experience, both functional and emotional, significantly impacts customer satisfaction and loyalty in online banking. Shaikh et al. (2020) noted similar findings in Finland, where mobile banking apps enhanced customer experience by focusing on ease of use and customization, resulting in improved satisfaction. Shin et al. (2020) conducted a study on digital banking in South Korea and conducted that convenience, security, and key factors that influence customer expectations. Interestingly, they found that customer and employee engagement were less significant were less significant in digital contexts compared to traditional banking. Similarly, Banu et al. (2019) highlighted the importance of trust and perceived usefulness in electronic banking in India, showing a positive relationship between these factors and customer satisfaction.

In Lebanon, Elhajjar and Ouaida (2020) demonstrated that customers with prior experience using digital platforms are more likely to adopt mobile banking services, reinforcing the importance of digital literacy in customer adoption. Santini et al. (2019) found that in electronic banking, perceived risk was not significantly influenced by the medium of banking, indicating that customers may perceive similar levels of risk whether they use online or offline channels. In a Finish study, Komulainen and Saraniemi (2019) observed that the perceived capabilities of control, trust, and social status enhance the customer experience in mobile banking. Similarly, Makanyeza and Mutambayashata (2018) conducted those social influences positively impact the adoption of debit and credit cards in Zimbabwe, underlining the role of societal factors in customer decisions.

A Study in Taiwan, found that satisfaction mediates the relationship between service quality and loyalty in electronic banking. Thakur (2014) confirmed that ease of use plays a critical role in customer satisfaction, loyalty, and service quality in mobile banking. Klaus and Maklan (2013), in their research on e-banking in the UK, found a stronger correlation between customer experience and loyalty intentions than between customer satisfaction and loyalty. A study by Liebana-Cabanillas et al. (2013) in Spain similarly indicated that trust, helpfulness, and satisfaction are important predictors of positive customer relationships in digital banking.

In India, Kundu and Datta (2012) discovered that mobile banking is predominantly used for routine transactions, such as bill payments, emphasizing convenience as a primary factor for adoption. Aldas Manzano et al. (2011), researching electronic banking in Spain, found that customer satisfaction strongly influences loyalty when perceived risk is low. The role of convenience and reliability is further highlighted by Ganguli and Roy (2011) in their study on technology-based banking in India. In Taiwan, Lin (2011) demonstrated that perceived ease of use and compatibility significantly influence customers' attitudes toward mobile banking which in turn impacts their intention to adopt the service.

The importance of trust in digital banking adoption is underscored by Lee and Chung (2009), who found that trust is the most critical factor in customer satisfaction with

mobile banking in South Korea. Earlier studies, such as Kuisma et al. (2007) in Finland, highlighted security and psychological concerns as barriers to e-banking adoption, while Flavian et al. (2005) showed that bank image plays a strong role in building trust during the early stages of internet banking adoption.

Studies such as Rajeshwaran (2020) found that all income groups, especially younger and more educated customers, are increasing adopting digital banking. This suggests that customer satisfaction in digital banking is influenced more by usability and topical relevance than by demographic factors like gender, age, or region, supporting earlier research by Mbama and Ezepue (2018), which concluded that frequency of use, age group, and duration of use positively influence digital banking experience.

The literature also notes mixed findings on the impact of gender. Vijayalakshmi and Rajasekhar (2018), for instance, observed that women tend to prioritize convenience in banking, favouring digital channels, while men are more concerned with security, which may drive a preference for physical branches. Serener (2016) further highlighted that marital status influences the likelihood of adopting internet banking with married individuals in Northern Cyprus being less likely to use online services compared to single respondents.

While digital banking continues to rise, physical bank branches still play a crucial role in customer satisfaction, particularly for services requiring personal interaction and trust. Geng, Abhishek, and Li (2015) showed that branch openings lead to short-term increases in online banking usage, though closures facilitate complex financial decisions, build customer trust, and help in the promotion of new services. Physical branches remain important for customer acquisition and building relationships, as highlighted by studies on branch closures and their impact. S&P Global Market Intelligence (2019) pointed to a global trend of bank branch closures yet emphasized that these branches still serve as key touchpoints for customer interaction, especially for individuals seeking personal advice or customers closures can cause a steady decline in online transactions.

Payments Cards and Mobile (2019) argued that physical branches, while facing closure in some regions, continue to be relevant, especially in rural areas where internet penetration is low. Studies also show that customers prefer in-person services when opening new accounts or handling complicated products like loans and mortgages, as these personalized attention and expert advice.

Physical branches are evolving to adopt a more customer-centric approach, incorporating digital tools to complement their in-person services. The integration of advanced ATM and customer relationship management technology has improved the efficiency of branches, enabling banks to better serve tech-savvy customers while maintaining trust with less digitally inclined users. Branches are also being transformed to focus on financial education and customer service, providing a holistic banking experience that integrates both digital and traditional elements.

3. METHODOLOGY

3.1 Research Design and Approach

This study utilized a quantitative research design to explore customer preferences and experiences across two primary banking channels-digital banking and physical bank branches in Sri Lanka. The research adopted a comparative approach to evaluate how demographic and experiential factors influence the preference for each channel. A survey -based method was used to collect primary data, complemented by secondary data from established databases and government websites.

3.2 Data Collection Procedure

Primary data were collected via an online questionnaire designed to capture customer experiences and performances. The questionnaire was distributed to customers of commercial banks in Sri Lanka who had experience with both digital banking and physical bank branches. The sample included respondents with additional experience in using alternative banking channels such as automated teller machines (ATMs) cash deposit machine, cash recycler machines, chatbots, and phone banking.

To ensure the inclusion of respondents less familiar with digital platforms, an alternative method of data collection was employed. In regions such as the Gampaha District, including cities like Munuwangoda, Negombo, and meerigama, responses were gathered through face-face interviewer in the online survey form. This approach ensured comprehensive coverage of banking customers across both urban and rural settings capturing a diverse range of experiences and preferences.

Secondary data sources, including academic databases like Emerald insight and Google Scholar, provided background information on customer experience in banking, as well as relevant statistics from the Central Bank of Sri Lanka. These secondary sources were used to contextualize the study within the broader literature on banking channels.

3.3 Variables and Measurements

The study incorporated both demographic and customer experience variables base on established models from previous research. The demographic variables examined were:

1. Age (continuous)

2. Gender (categorical)

3. Education level (categorical)

4. Income level (categorical)

5. Marital status (categorical)

6. Province (categorical)

7. Employment sector (categorical)

These demographic factors were included to understand their influence on customer preferences for digital or physical banking services.

CX variables measured based on four key dimensions commonly used in the literature:

1. Perceived ease of uses reflects the user's belief that using the banking channel would be free of effort (PEOU).
2. Perceived efficiency: measures the user's perception of the channel's ability to perform banking tasks quickly and effectively (PEffi).
3. Perceived control: assesses the user's sense of control over the banking process when using the channel (PCon).
4. Perceived security: captures the user's confidence in the safety and security of the banking channel (PSec).

These variables were operationalized through Likert-scale items in questionnaire, allowing for a detailed analysis of customer experiences with both digital and physical banking channels.

3.4 Analytical Framework

Two models were developed to assess customer preferences for digital banking and physical bank branches, respectively. The dependent variable in each model was binary: a consumer's preference for either digital banking or physical bank branches (yes=1, no=0). The models include continuous variables like age and professional experience and categorical variables like gender, education, income, employment sector, etc.

Model 1: digital banking (DB) preferred (1) or not preferred (0), where non-preference included a preference for either physical bank branches or alternative channels.

$$\mathbf{DB_{preferred} = \alpha_0 + \alpha\ D_{factors} + \alpha_1\ PEOU + \alpha_2\ PE\ ffi + \alpha_3\ PCon + \alpha_4\ PSec + e}$$

Model 2: physical bank branch (PBB) preferred (1) or not preferred (0), where non-preference included a preference for either digital banking or other alternative banking channels.

$$\mathbf{PBB_{preferred} = \beta 0 + \beta D_{factors} + \beta\ D\ factors + \beta_1\ PEOU + \beta_2 PEffi + \beta_3\ PCon + \beta_4\ PSec + e}$$

The binary nature of the dependent variables led to the selection of probit regression as the primary analytical technique. The probit model is appropriate for cases where the dependent variable is dichotomous, allowing for the estimation of the probability that a customer prefers one channel over another based on the independent variables.

3.5 Probit Regression Analysis

Probit regression analysis was conducted using Stata software (version 14.2). this analysis aimed to identify significant predictors of customer preferences for either digital or physical banking channels. Independent variables included both the demographic factors (age, gender, education, income, marital status, province, and employment sector) and the customer experience variables (perceived ease of use, perceived efficiency, perceived control, and perceived security).

The results from the probit regression analysis were compared across the two models to examine differences in the factors influencing the preference for digital banking versus physical bank branches. This comparative analysis helped identify which variables play a more prominent role in driving customer preferences for each channel.

3.6 Hypotheses Development and Testing

Hypotheses were formulated based on insights from existing literature on banking channel preferences and customer experience. Each hypothesis proposed a relationship between the independent variables (demographic and customer experience factors) and the likelihood of customers preferring digital banking or physical bank branches. These hypotheses were tested through the probit regression models, with statistical significance evaluated using conventional thresholds (e.g., p-values).

H1: There is a relationship between banking channel preference and the customer's age.

H2: There is a relationship between banking channel preference and the customer's education level.

H3: There is a relationship between banking channel preference and perceived security.

The null hypotheses would state that no such relationship exist.

Where are the hypotheses which formulated to test the preference for digital banking channels or physical branches? Since two models have been set up, there should be two separate hypotheses to test the validity of each modal.

4. DATA ANALYSIS AND DISCUSSION

4.1 Comprehensive Analysis of Descriptive Statistics

The descriptive statistics analysis provides an overall understanding of the distribution and characteristics of the respondents in this study. The average age of respondents is around 36 years, indicating that the sample comprises mostly adults in their prime working years. With a standard deviation of nearly 13 years, the age distribution is relatively spread out, suggesting a significant variation in the ages of

respondents. The average respondent has around 11 years of professional work experience. The wide standard deviation indicates a significant range of experiences. A significant majority (76.68) of the respondents have tertiary education, including that most of the participants are well-educated. This suggests that findings may reflect the perspectives of a more educated segment of the population. Only about a quarter of the respondents have primary or secondary education, which may point to potential differences in financial and banking literacy levels.

The most common income bracket is 50k-100k (42.69%), showing that most respondents belong to middle income households. The higher income brackets (100k+) make up about 35% of the sample, indicating a significant portion of respondents with above average incomes, which could influence their banking preferences and behaviour. The presence of low-income respondents (22.53%) ensures that the study also captures the experiences of individuals who might be more price sensitive or less digitally equipped.

The nearly even split between married and unmarried respondents suggest that the sample is diverse in terms of family status. This factor might influence preferences related to financial planning savings and banking needs.

A slight majority of respondents are from the Western Province, which could mean the result may be more reflective of individuals from urban or densely populated regions. The representation from outside Western Province (43.87) is still substantial, ensuring that perspectives from more rural or less urbanized regions are also considered. Most respondents work in the private sector (68.77), suggesting that the findings may reflect the perspectives of individuals working in corporate or business environments, which could influence their banking preferences. The public sector representation (31,23%) ensures that views from government employees are also captured.

The majority of respondents prefer digital banking (60.87%), indicating a significant shift towards online banking and a reduced reliance on physical branches. However, a notable portion (20.16%) still prefers physical branches, highlighting the ongoing need for physical bank services, particularly for those who may not be as comfortable with digital platforms. A large majority of respondents (80.24%) report positive experiences with the ease of use of digital banking, suggesting that digital banking platforms are user friendly and accessible for most individuals. Positive experiences with physical bank branches are slightly lower (55.34%), indicating that while many are satisfied with traditional banking, it is perceived as less convenient compared to digital options. Digital banking is rated highly efficient by most respondents (81.82%), further reinforcing the growing preference for online services over physical branches. Physical branch efficiency is still rated positively by more than half (59.68%), but the lower score compared to digital banking suggest room for improvement in the traditional banking sector.

Digital banking offers a sense of control to 71.15% of users, indicating that user feel empowered and in control of their finances through digital platforms. Physical branches are rated positively by 60.87% of respondents, but the slightly lower rating

may indicate that digital platforms offer greater flexibility and autonomy. While most responds feel secure using digital banking (67.98%), the higher security rating for physical branches (84.19) suggests that traditional banking methods are still viewed as more secure. This could imply that security concerns remain a key barrier to digital banking adoption, despite the overall positive experience with digital platforms.

4.2 Analysis of Inferential Statistics

The study examines two probit regression models to analyse customer preferences for banking channels in Sri Lanka. The dependent variables are binary, with model 1 predicting preference for digital banking (DB) and model 2 predicting preference for physical branch banking (PBB). Each model uses various demographic and experience related factors as independent variables. Maximum likelihood estimation methods were employed to estimate the models, with pseudo R^2 values reflecting the fit.

Table 1: Probit Model for Digital Banking Channel (DB Preferred)

Variable	Coefficient	Z-statistics	P-value	Significance
Intercept	3.161	0.428	>0.1	Not significant
In Age	-2.087	-	>0.1	Not significant
Tertiary Education	3.327	3.214	<0.01	***
Male	-0.589	-0.824	>0.1	Not significant
Income 50,000	0.667	0.616	>0.1	Not significant
Income 100,200	0.590	0.529	>0.1	Not significant
Income 200+	2.474	1.516	>0.1	Not significant
Married	1.150	1.173	>0.1	Not significant
Outside Western Province	-1.190	-1.851	<0.1	*
Employment Sector (Public)	0.0221	0.0335	>0.1	Not significant
EOU DB (Positive)	0.859	1.276	>0.1	Not significant
Effi DB (Positive)	0.346	0.553	>0.1	Not significant
Employment Sector (Public)	0.0221	0.0335	>0.1	Not significant
EOU DB (Positive)	0.859	1.276	>0.1	Not significant
Effi DB (Positive)	0.346	0.553	>0.1	Not significant
Sec DB(Positive)	1.989	2.517	<0.05	**
Sec DB (Positive)	2.309	2.327	<0.05	**

Pseudo R^2 value: >0.8 (indicating good fit)

Table 2: Probit Model for Physical Branch Banking Channel (PBB Preferred)

Variable	Coefficient	Z-statistics	P-value	Significance
Intercept	-2.838	-2.170	<0.05	**
In Age	0.860	-	<0.05	**
Tertiary Education	-0.884	-3.505	<0.01	***
Male	0.121	0.624	>0.1	Not significant
Income 50,100	-0.393	-1.495	>0.1	Not significant
Income 100,200	-0.565	-1.792	<0.1	*
Income 200+	-0.327	-0.893	>0.1	
Married	-0.235	-0.962	>0.1	Not significant
Outside Western Province	0.171	0.937	>0.1	Not significant
Employment Sector (Public)	-0.0961	0.473	>0.1	Not significant
EOU DB (Positive)	0.317	1.216	>0.1	Not significant
Effi DB (Positive)	0.138	0.529	>0.1	Not significant
Con PBB (positive)	0.215	0.883	>0.1	Not significant
Sec PBB (positive)	0.0654	0.223	>0.1	Not significant

Pseudo R^2 value: <0.5 (indicating a moderate fit)
In both tables, significance levels are denoted as,
P < 0.01 (Highly significant) P <0.05 (Significant) P < 0.1(Slightly significant)

In model 1 (DB) the coefficient for age is negative but statistically insignificant. This suggests that age does not significantly impact preference for digital banking. But in model 2 (PBB), age is positively and statistically significant ($p<0.05$), indicating that older customers are more likely to prefer physical branch banking. Specially, for each unit increase in log age, the probability of preferring physical branches by approximately 0.86, meaning that as age increases, does the preference for physical branches. Tertiary education is highly significant ($p<0.01$) and positively related to digital banking preference with a coefficient of 3.327 in the model 1. This suggests that customers with tertiary education are over three times more likely to prefer digital banking compared to those with only primary or secondary education. In model (PBB), tertiary education shows a significant negative relationship ($p<0.01$) with physical branch preference, with a coefficient of -0.884. This indicates that individuals with higher education levels are less inclined to prefer physical branch banking, potentially due to grater digital literacy or access to digital resources.
The coefficient for male is -0.589, with a non-significant z-statistic (-0.824), indicating that gender does not have a statistically significant impact on digital preference in model 1. Although not significant, the negative coefficient suggests a slight tendency for males to have a lower preference for digital banking than females, but this is not strong enough to draw a definitive conclusion. However, in model 2, the male coefficient is 0.121, again non-significant (z-statistic 0.624), meaning

gender does not significantly influence the preference for physical branch banking either. The positive coefficient, while not significant, suggests that males may have a slightly higher preference for physical branches compared to females, but this effect is too weak statistically to be meaningful. In both models, gender does not significantly affect the choice between digital banking and physical branches. Thus, any observed trends by gender are likely due to random variation in the sample rather than a genuine effect.

Model 1 imply that none of the income categories significantly influence the preference for digital banking, suggesting that income level does not play a meaningful role in the choice of digital banking in Sri Lanka. Model 2 suggests that customers with moderate income may have a minor inclination away from physical branch banking, but high and low-income categories show no clear trend in preference. These interpretations highlight that both gender and income generally have limited influence on the choice between digital and physical banking channels in this study, with only minor effects observed in specific income ranges. The marital status variable is not significant, although married individuals show a slight, non-significant increase in preference for digital banking. Similarly, marital status does not significantly affect preference for physical branch banking, indicating limited influence on channel preference based on marital status. A slightly negative significant coefficient suggests that customers outside the Western Province are marginally less likely to prefer digital banking, possibly due to limited access to digital banking. Province is not a significant predictor, meaning that preference for physical branches does not very significantly by location.

Perceived control and perceived security are positively significant, indicating that positive experiences in these areas increase digital banking preference. Specifically, customers with positive perceptions of digital banking control and security are almost twice as likely to prefer digital banking with coefficients of 1.989 and 2.309, respectively. None of the customer experience factors significantly impact preference for physical branch banking, suggesting that experience factors in model 2 are less influential on physical branch preference.

4.3 Hypothesis Testing Analysis on Banking Channel Preferences

This analysis employs probit regression to assess whether customer characteristics – age, education level, and perceived security- significantly impact banking channel preferences in Sri Lanka, specifically digital banking (DB) and physical bank branch (PBB) usage. Each hypothesis is evaluated using a 95% confidence interval, where a p-value <0.05 indicates significance.

Hypothesis 1: Relationship between Age and Banking Channel Preference

The analysis shows no significant relationship between age and preference for DB, as the p-value is above 0.05. Therefore, the null hypothesis, which states that age does not influence digital banking preference, is accepted.

For PBB, there is a significant positive relationship with age. This result supports the alternative hypothesis, suggesting that older customers are more likely to prefer physical bank branches. Age has no significant impact on digital banking preference, while it positively influences physical branch preference in the Sri Lankan context.

Hypothesis 2: Relationship between Education Level and Banking Chennel Preference

Both DB and PBB, education level is highly significant in both models. This indicate that customers with tertiary education are more likely to prefer digital banking. Customers with only primary or secondary education tend to prefer physical bank branches. Finally, education level has a strong influence on banking channel preference, with higher education linked to digital banking preference and lower education linked to physical branch. Education level has a strong influence on banking channel preference, with higher education linked to digital banking preference and lower education linked to physical branch preference.

Hypothesis 3: Relationship between Perceived Security and Banking Channel Preference

Perceived security has a significant positive impact on DB preference. Thus, the alternative hypothesis is accepted, suggesting that perceived security is a key factor in digital banking preference. No significant relationship is found between perceived security and PBB preference, with the p-value exceeding 0.05. Therefore, the null hypothesis is accepted, implying that perceived security does not influence physical branch preference. Perceived security affects digital baking preference but has no significant impact on physical branch preference in the Sri Lankan setting.

5. CONCLUSION AND POLICY RECOMMENDATION

5.1 Conclusion

This study found that customer preferences and satisfaction levels in Sri Lanka's banking sector vary significantly between digital and physical channels. While younger, customers prefer the convenience and efficiency of digital banking, older generations and customers with lower technological literacy shows a preference for traditional bank branch. Key factors such as perceived security and control are especially crucial for customers using digital channels, where trust and usability are paramount to enhancing satisfaction. The study suggests that banks can improve customer experience by addressing unique demographic needs- such as providing additional support for seniors or enhanced security features for tech-savvy, security-conscious customers. To foster a more integrated and accessible banking environment, Sri Lankan banks should aim to offer a seamless omnichannel experience that combines the accessibility of physical branches with the efficiency of digital services, ultimately enhancing customer satisfaction and loyalty across diverse user segments.

This study reveals that a seamless, secure, and personalized banking experience across digital and physical channels is crucial to meeting diverse customer needs in

Sri Lanka. Banks that cater specifically to demographic needs- where through physical branch support for seniors or digital enhancement for educated user- stand to boost satisfaction and retention. Embracing technologies like AI and chatbots, prioritizing clear, consistent communication, and facilitating smooth transitions across channels can further strengthen customer experience.

As Sri Lankan banks evolve with digital trends, the emphasis on security, ease of use, and integration will become essential to fostering customer confidence. By implementing these targeted strategies, commercial banks can create a customer - centric approach that adopts to varying preferences, ultimately enhancing loyalty and satisfaction across all demographics.

5.2 Policy Recommendations

Enhance accessibility for seniors: Improve physical branch accessibility by installing ramps, wider doorways, and specialized counters for senior customers. Staff training on respectful communication and simplified banking processes can improve the senior customer experience.

Promote digital literacy for older adults: Organize workshops at branches and community centres to educate seniors on online and mobile banking, focusing on navigation, cybersecurity, and simplified interfaces.

Develop user-friendly digital platforms: Invest in intuitive digital banking interfaces that accommodate varying levels of tech proficiency, especially for older customers. Provide features like biometric login options, customizable dashboards, and straightforward navigation to improve usability.

Security enhancements for all customers: Strengthen security with muti-factor authentication, strong encryption, and regular security audits. Make security measures transparent to customers, and proactively educate them about identifying fraud and resolving security concerns.

Seamless omnichannel experience: Enable smooth transitions between physical and digital channels by integrating services. Allow customers to start transactions online and complete them in-branch if necessary and offer phone and video support for assistance.

Personalization for educated and tech-savvy users: Use customer data to tailor services, such as targeted product recommendations, financial insights, and customized alerts, focusing on efficiency and personalized financial management tools.

Proactive customer engagement and feedback: Regularly gather and analyse customer feedback through surveys and social media to address emerging needs, adjust services, and improve overall customer satisfaction.

By implementing these recommendations, Sri Lankan banks can enhance across demographics, build trust, and foster customer loyalty by offering a secure, accessible, and personalized banking experience.

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