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*Exploring the Use of Psychometrics and Data Mining  
as Novel Screening Mechanisms to Promote the Use  
of the Islamic Participatory Modes of Financing for  
SMEs: The Case Study of The Gambia*

Seedy Conteh

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**Exploring the Use of Psychometrics and Data Mining as Novel  
Screening Mechanisms to Promote the Use of the Islamic  
Participatory Modes of Financing for SMEs: The Case Study of  
The Gambia**

A dissertation submitted in fulfilment of the requirements for the

award of

The Degree of Doctor of Philosophy

**Seedy Conteh**

Department of Economics and Finance

Durham University

2025

## Abstract

SMEs are widely acknowledged as engines of economic growth, employment, and innovation, particularly in developing and emerging economies. However, access to finance continues to pose a significant barrier to their development, scalability, and long-term sustainability. Traditional debt-based financing models, largely employed by the conventional financial institutions, often exclude SMEs due to several structural limitations, including the absence of verifiable credit histories, insufficient collateral, weak financial documentation, and informality. These limitations significantly reduce the ability of lenders to assess risk reliably, leading to credit rationing for SMEs. In contrast, Islamic participatory financing modes, such as *Mudarabah* (profit-sharing), *Musharakah* (joint venture) and *Musharakah Mutanaqisah* (Diminishing partnership), present ethical and inclusive alternatives. These financing instruments are underpinned by risk-sharing principles that align well with the economic characteristics and financing needs of SMEs and startups generally.

In theory, such Islamic participatory modes should enhance access to finance for SMEs by shifting the focus from collateral-based lending to partnership-based financing. However, in practice, the widespread application of these instruments particularly by Islamic Financial Institutions has remained limited. This reluctance is largely driven by challenges such as information asymmetry, a lack of mutual trust, and uncertainty regarding the entrepreneurial skills, character, and competence of prospective SME partners. To bridge this gap, this study sought to evaluate the potential value of psychometrics and data mining classification techniques as innovative screening mechanisms to assess SME operators' trustworthiness, entrepreneurial aptitude, and financial management skills as a conduit to promote the use of the Islamic participatory modes of financing by the Islamic finance institutions for SMEs. This was done in two empirical analyses, beginning with psychometric testing with multiple regressions and concluding with the data mining technique of classification.

The first inferential analysis employed a three-stage psychometric evaluation using multiple regressions. Stage one established firm performance, stage two assessed the potential moral hazard risk using SME operator's trustworthiness as proxy, and stage three, evaluated the IFI's decision to finance SMEs with participatory modes based on insights from the first two stages. Results from the first stage revealed that solvency ratio, operating leverage ratio, and financial management skills were significantly associated with firm performance. Variables such as firm age, financial leverage ratio, business sector, business location, entrepreneur's experience, educational level, age, and gender, all showed positive but statistically insignificant

relationships with firm performance. In stage two, entrepreneurial skills of the SME operator, financial management skills of the SME operator, willingness of the SME operator to use participatory financing modes, knowledge level of the SME operator on the Islamic finance principles and products, and firm age, were all significantly related to the trustworthiness of SME operators which was used as a proxy for mitigating moral hazard problem in Islamic participatory financing. In stage three, both mean and factor scores demonstrated that entrepreneurial skills, financial management skills, willingness to use participatory finance, along with both financial ratios (solvency, operating leverage, and financial leverage ratios) and non-financial ratios (firm age, ownership status, respondent's age, educational level and experience) have a statistically significant influence on IFI's decisions to deploy Islamic participatory financing. Interestingly, the knowledge level of SME operators on the Islamic finance principle and products showed a negative but statistically insignificant relationship with IFI's decision to use participatory modes for SME financing.

In the second inferential analysis, SME respondents were classified into 'suitable' or 'unsuitable' candidates for financing with the Islamic participatory modes, using four classification algorithms including CART, CHAID, C5.0, and REPTree and criteria such as precision, recall and F-measure. Results from the analysis showed that, the CHAID algorithm outperformed the others with over 78 per cent accuracy for mean scores and 72 per cent for factor scores. The confusion matrix showed that the model correctly classified 73 per cent of suitable SMEs and 84 per cent of unsuitable SMEs using mean scores, and 78 per cent of suitable SMEs and 66 per cent of unsuitable SMEs using factor scores.

In conclusion, the thesis presents a compelling case for incorporating psychometric testing and data mining into SME risk assessment frameworks, especially with regard to using equity-like financing arrangements like the Islamic participatory modes. This integration could significantly enhance the ability of Islamic financial institutions to identify reliable SME partners and expand the use of participatory financing mechanisms.

## **DECLARATION**

This dissertation has not been submitted in any part for any other degree or qualifying examination at this or any other university. Unless the manuscript indicates otherwise, this dissertation is entirely my own work.

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# Table of Contents

CHAPTER 1 .....	23
INTRODUCTION .....	23
1.1 Research Background and Motivation.....	23
1.2 The Research Problem Statement .....	28
1.3 Research Aims, Objectives and Research Questions:.....	29
1.4 Research Scope .....	30
1.5 Rationale and Motivation of the Study .....	31
1.6 Research Significance.....	32
1.6.1 Theoretical and Academic Significance.....	33
1.6.2 Practical or Industry Significance .....	34
1.6.3 Economic and Development Significance .....	34
1.6.4 Socio-Cultural, Ethical and Policy Significance.....	35
1.7 Overview of Research.....	36
1.8 Conclusion .....	38
CHAPTER 2 .....	40
LITERATURE REVIEW .....	40
2.1 Definition and Evolution of SMEs .....	40
2.2 The Economic Significance of Global SMEs .....	43
2.2.1 Employment Creation .....	43
2.2.2 Contribution to GDP .....	44
2.2.3 Entrepreneurship Development .....	44
2.2.4 Facilitation of Innovation.....	45
2.3 Economics of SME Financing .....	46
2.3.1. Information Asymmetry .....	47
2.3.2 Transaction Costs .....	49
2.3.3. Owner and Firm Characteristics .....	50

2.4 SME Financing and Financing Constraints .....	52
2.5 Demand and Supply Side Causes of SME Financing Constraints.....	53
2.5.1 Demand-Side Factors.....	54
2.5.2 Supply-Side Factors .....	56
2.6 SME Financing Models .....	58
2.6.1 Traditional Banking Model .....	58
2.6.2 Non-Bank Financial Institutions Model.....	59
2.6.3 NGO Model .....	59
2.6.4 Crowdfunding and Digital Financing Model.....	61
2.7 Sources of SME Finance.....	62
2.7.1 Internal Sources .....	62
2.7.2 External Sources .....	63
2.8 Conclusion .....	69
CHAPTER 3 .....	70
ISLAM, ENTREPRENEURSHIP, CHALLENGES OF ISLAMIC PARTICIPATORY FINANCING AND THE PROPOSED SOLUTION.....	70
3.1 Theoretical Framework.....	70
3.1.1 Information Asymmetry Theory .....	70
3.1.2 Islamic Entrepreneurship Theory.....	71
3.1.3 Institutional Logic Theory .....	72
3.2 Islam and Entrepreneurship and the Islamic Entrepreneurship Framework.....	75
3.3 Islamic Finance: An Overview.....	77
3.3.1 Islamic Finance Contracts.....	78
i. Partnership-Based Contracts:.....	78
ii. Exchange-Based Contracts: .....	78
iii. Intermediation Contracts:.....	79
3.3.2 Islamic Finance Products .....	79

3.3.2.1 Non-Partnership-Based Products .....	80
3.3.2.2 Partnership-Based Products .....	80
3.4 Entrepreneurial Finance in Islam .....	80
3.5 The Islamic Participatory Modes of Financing.....	82
3.5.1 <i>Musharakah</i> .....	82
3.5.2 <i>Mudarabah</i> .....	84
3.5.3 <i>Musharakah Mutanaqisah</i> .....	86
3.6 Assessing the Suitability of the Islamic Participatory Modes for financing SMEs .....	88
3.7 Some Major Challenges of Using the Islamic Participatory Financing Modes for SMEs. .....	90
3.7.1 Lack of Trust in SME Entrepreneurs .....	90
3.7.2 Poor Financial Management Skills of SME Entrepreneurs .....	91
3.7.3 Poor Entrepreneurial Skills of SME Entrepreneurs .....	93
3.7.4 Knowledge level, Willingness, Firm Profitability and Other Entrepreneur Attributes .....	94
3.8 Probing Psychometrics and Data Mining for Solutions: A Conceptual Review.....	95
3.8.1 Psychometrics .....	95
3.8.2 Data Mining .....	97
3.9 Empirical Review and the Research Conceptual Framework.....	99
3.9.1 Trust .....	99
3.9.2 Financial Management Skills.....	102
3.9.3 Entrepreneurial Skills of the SME Entrepreneur .....	105
3.9.4 Knowledge Level of SME Entrepreneurs on IF Principles and Products.....	109
3.9.5 Willingness of SME Entrepreneurs to Use the Participatory Modes .....	110
.....	112
3.10 Conclusion .....	112
CHAPTER 4 .....	114
THE RESEARCH CONTEXT .....	114

4.0 Introduction.....	114
4.1 The Research Setting: A Snapshot of the Political, Economic and Financial Systems of The Gambia.....	114
4.1.1 Economic and Financial Systems .....	115
4.1.3 Gambian SMEs and SME financing.....	120
CHAPTER 5 .....	124
RESEARCH METHODOLOGY.....	124
5.0 Introduction.....	124
5.1 The Research Philosophy.....	124
5.2 Research Design.....	127
5.3 The Research Method .....	128
5.4 The Research Data Collection .....	129
5.5 Sampling Design.....	130
5.5.1 The Research Population .....	130
5.5.2 Sampling Frame.....	131
5.5.3 Sampling Size .....	132
5.5.4 Sampling Method.....	132
5.5.5 Sampling Element.....	133
5.6 The Research Instrument .....	134
5.6.1 Developing the Instrument.....	134
5.6.2 Objective of the Instrument .....	135
5.7 The Research Variables.....	135
5.7.1 Trust .....	135
5.7.1.1 Research Operational Definition of Trust.....	136
5.7.1.2 Measurement of Trust Variable .....	137
5.7.2 Financial Management Skills.....	137
5.7.2.1 Research Operational Definition of Financial Management Skills .....	138

5.7.2.2 Measurement of Financial Management Skills Variable .....	138
5.7.3 Entrepreneurship Skills.....	139
5.7.3.1 Operational Definition of Entrepreneurship Skills Variable .....	139
5.7.3.2 Measurement of the Entrepreneurship Skills Variable.....	140
5.7.3.3 Knowledge level of SME operators on Islamic Finance Principles and Products .....	141
5.7.3.4 Willingness of SME Operators to Use Islamic Participatory Modes.....	142
5.8 The Research Questionnaire .....	143
5.8.1 The Questionnaire Testing (The Pilot).....	144
5.8.2 Instrument Validation.....	145
5.8.3 Reliability.....	145
5.8.5 Validity .....	147
5.9 Data Processing.....	149
5.10 Empirical Models.....	150
5.10.1 Multiple Regression.....	150
5.10.2 Decision Tree Analysis .....	152
5.11 Conclusion .....	157
CHAPTER 6 .....	158
ANALYSIS OF DESCRIPTIVE STATISTICS .....	158
6.0 Introduction.....	158
6.1 Data Entry and Coding.....	158
6.3 Pearson Correlation Analysis.....	160
6.4 SME Entrepreneur’s Demographic and Firm Profile .....	163
6.4.1 Gender Distribution .....	163
6.4.2 Age Distribution.....	164
5.4.3 Education Level .....	165
6.4.4 Business Sector .....	166

6.4.5 Location of SMEs .....	167
6.4.6 Number of Employees .....	168
6.4.7 Ownership Structure .....	169
6.4.8 Years of Business Experience .....	169
CHAPTER 7 .....	171
PROMOTING THE USE OF THE ISLAMIC PARTICIPATORY MODES OF FINANCING FOR SMES: A PSYCHOMETRIC ANALYSIS.....	171
7.0 Introduction.....	171
7.1 Psychometric Analysis with Multiple Regression .....	171
7.1.1 Analysis of Some Psychometric Properties .....	171
7.1.1.1 Reliability Analysis.....	171
7.1.1.2 Validity .....	172
7.1.1.3 Factor Analysis.....	175
7.2 Multiple Regression Analyses.....	180
7.3 Assumption Checks for Multiple Regression .....	181
7.3.2 Multicollinearity .....	183
7.4 Screening Process with Regression for IFIs use of the Participatory modes for SMEs .....	184
7.4.1 Step 1: Establishing the financial performance .....	184
Model 1 .....	184
Model 2 .....	187
7.4.2 Step 2: Operator Trustworthiness (addressing the impending moral hazard issues) .....	190
Model 3 .....	191
Model 4.....	193
7.4.3 Step 3: IFI’s Decision to use the Islamic Participatory Modes.....	196
Model 5 .....	196
Model 6 .....	199

7.5 Conclusion .....	202
CHAPTER 8 .....	204
SCREENING SME CLIENTS FOR THE USE OF THE ISLAMIC PARTICIPATORY MODES OF FINANCING: A DATA MINING APPROACH WITH DECISION TREE.....	204
8.0 Introduction.....	204
8.1 A Decision Tree.....	206
8.2 Decision Tree Algorithms .....	207
8.2.1 Classification and Regression Tree (CART).....	207
8.2.2 Chi-square Automatic Interaction Detector (CHAID).....	208
8.2.3 C5.0.....	208
8.2.4 REPTree .....	208
8.3 The Variables.....	209
Trust .....	209
Financial Management Skills.....	209
Entrepreneurial Skills.....	210
Willingness of SME Entrepreneurs.....	210
Knowledge of SME Entrepreneurs on Islamic Finance Principles and Products .....	210
Firm Performance .....	211
Non-financial Ratios .....	211
Financial Ratios .....	211
Decision of Islamic finance institutions to use the Participatory Modes.....	211
8.4 Scoring Technique.....	212
8.5 The WEKA Software .....	213
8.6 Decision Tree Analysis .....	214
8.6.1 Model Training and Validation .....	214
Accuracy: .....	215
Precision:.....	215

Recall: .....	216
F-Measure: .....	216
Confusion Matrix .....	216
8.7 Decision Trees.....	216
8.7.1 Decision Tree Based on Mean Scores.....	216
8.7.2 Decision Tree based on Factor Scores .....	223
8.8 Conclusion .....	228
CHAPTER 9 .....	229
DISCUSSIONS ON THE RESEARCH RESULTS .....	229
9.0 Introduction.....	229
9.1 Discussions on Result of Descriptive Statistics .....	229
9.1.1 Socio-demographic features of SME Entrepreneurs.....	229
9.1.2 Firm Level Features .....	231
9.2 Discussion on Psychometric Regression Models .....	233
9.2.1 Firm Performance Models .....	233
9.2.2 Operator Trust (Addressing Impending Moral Hazard issues).....	242
9.2.3 Decision of IFIs to Use Islamic Participatory Financing Modes.....	246
9.3 Discussion on Decision Tree Analysis .....	250
9.4 Analysis of Hypothesis Testing.....	253
9.5 Comparison of the Empirical Results .....	257
9.6 Conclusion .....	258
CHAPTER 10 .....	261
CONCLUSION AND RECOMMENDATIONS .....	261
10.0 Introduction.....	261
10.1 Summary of Key Empirical Findings .....	261
10.2 Implications of the Research Results.....	263
10.3 Research Limitations .....	267

10.4 Recommendations.....	271
10.5 Future Research Direction .....	279
Bibliography .....	282

## List of Tables

<b>Table</b>	<b>Description</b>	<b>Page Number</b>
Table 4.1	Composition of the Financial System	117
Table 4.2	Consolidated Assets of Commercial banks	118
Table 4.3	Characteristics of MSMEs at each level	121
Table 5.1	The Population of SME Clients	130
Table 5.2	The Sampling Frame of SME Clients	131
Table 5.3	Characteristics of MEMEs at each level	133
Table 5.4	Scale Reliability Statistics	146
Table 5.5	List of Some Scales Utilised in Developing the Research Questionnaire	155
Table 6.1	Frequency Analysis of the Research Variable	159
Table 6.2	Correlation Matrix based on Mean Scores	161
Table 6.3	Correlation Matrix based on Factor Scores	162
Table 6.4	Frequencies of Gender	163
Table 6.5	Age Distribution	164
Table 6.6	Frequencies of Education	165
Table 6.7	Frequencies of Business sector	166
Table 6.8	Frequencies of Location	167
Table 6.9	Frequencies of No of employees	168
Table 6.10	Frequencies of Ownership status	169
Table 6.11	Frequencies of Years of business experience	170
Table 7.1	Scale Reliability Statistics	172
Table 7.2	Bartlett's Test of Sphericity	174
Table 7.3	Factor Loadings	175
Table 7.4	Factor Loadings	178
Table 7.5	Summary of total variance explained	179
Table 7.6	Model Fit Measures	180
Table 7.7	Collinearity Statistics	183
Table 7.8	Model Fit Measures	185
Table 7.9	Model Coefficients - Firm performance mean	186
Table 7.10	Model Coefficients - Firm performance	188
Table 7.11	Model Fit Measures	190
Table 7.12	Model Fit Measures	192
Table 7.13	Model Coefficients – Trust	193
Table 7.14	Model Coefficients - Trust	194
Table 7.15	Model Fit Measures	195
Table 7.16	Model Fit Measures	197
Table 7.17	Model Coefficients - Decision of IFIs to use Participatory Modes with Factor Scores	198
Table 7.18	Model Fit Measures	200
Table 7.19	Model Coefficients - Decision of IFIs to use Participatory Modes with Mean Scores	201
Table 8.0	Comparison of Decision Tree Classifiers Algorithms	209

Table 8.1	Research Attributes and their Possible Values	212
Table 8.2	Classification base on Mean scores	217
Table 8.3	Results of CHAID Classifier Algorithm	218
Table 8.4	Confusion Matrix for CHAID Algorithm	219
Table 8.5	Classification base on Factor scores	223
Table 8.6	Results of CHAID Classifier Algorithm	224
Table 8.7	Confusion Matrix for CHAID Algorithm	224
Table 8.8	Decision Rules Generated from CHAID Algorithm Mean Scores	227
Table 8.9	Decision Rules Generated from CHAID Algorithm Factor Scores	227
Table 9.0	Comparison of Decision Trees Based on Mean Scores and Factor Score	252
Table 9.1	Research Hypotheses based on Factor Scores	254
Table 9.2	Performance of the Research Variables across Empirical Models	257

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## **List of Figures**

<b>Figure Number</b>	<b>Description</b>	<b>Page Number</b>
Figure 1	The Research Conceptual Framework	107
Figure 2	Map of The Gambia	109
Figure 3	Q-Q Plot	173
Figure 4	Basic Structure of a Decision Tree	197
Figure 6	Decision tree based on the Mean Scores	211
Figure 7	Decision Tree based on the Factor Scores	215

## **List of Abbreviations**

<b>Abbreviations</b>	<b>Meanings</b>
AAOIFI	Accounting and Auditing Organisation for Islamic Finance Institutions
APET	Union High-Level Panel on Emerging Technologies
CRS	Catholic Relief Services
EBAN	European Business Angel Network
GDP	Gross Domestic Product
GIEPA	The Gambia Import and Export Promotion Agency
GNDP	The Gambia National Development Plan
ICD	Islamic Cooperation for the Development of the Private Sector
IFSB	Islamic Financial Services Board
ISRA	International Shariah Research Academy for Islamic Finance
LSEG	Londo Stock Exchange Group
MoTIE	Ministry of Trade, Industry, Regional Integration and Employment
NBFI	Non-Bank Financial Institutions
OECD	Organisation for Economic Co-operation and Development
ROSCA	Rotational Savings and Credit Associations
SBA	Small Business Association
SME	Small and Medium-size Enterprises
UNICEF	United Nations Children’s Fund
UNIDO	United Nation Industrial Development Organisation
USAID	The United States Agency for International Development
VISACA	Village Savings and Credit Associations

## List of Arabic Terminologies

Arabic Word	Meaning in Islamic Finance
<i>Falah</i>	Generally referred to as success in this world and hereafter in a religious sense.
<i>Gharar</i>	This means any element of absolute or excessive uncertainty in any business or a contract about the subject of contract or its price, or mere speculative risk. It has the potential to lead to undue loss to a party and unjustified enrichment of the other, which is prohibited.
<i>Hadith</i>	In the Islamic sense, it is the collection of the tradition including the sayings and actions of Prophet Muhammad (PBUH) which accounts for his daily practices.
<i>Haram</i>	Impermissible or unlawful.
<i>Hibah</i>	Gift or Donation.
<i>Ijarah</i>	Means letting on a lease. It refers to the sale of a definite usufruct of any asset in exchange for a definite reward. It refers to a contract of land leased at a fixed rent payable in cash and to a mode of financing adopted by Islamic banks. It is an arrangement under which the Islamic banks lease equipment, buildings or other facilities to a client, against an agreed rental.
<i>Istishna</i>	A type of sale, like Salam in which the price is paid to the manufacturer by the purchaser for specified goods that are subsequently manufactured and delivered on a stipulated date.
<i>kafalah</i>	Assumption of responsibility for a debt.
<i>Maqasid al-Shariah</i>	The purpose or ultimate wisdom behind a law or legal ruling. The general objectives of Islamic law, Shari'ah.
<i>Mudarabah</i>	A form of partnership where one party provides the funds while the other provides expertise and management. The latter is referred to as the Mudarib. Any profits accrued are shared between the two parties on a pre agreed basis, while loss is borne by the provider(s) of the capital.
<i>Mudarabah</i>	
<i>Mutlaqah</i>	Unrestricted Musharakah or partnership.
<i>Mudarib</i>	In a Mudaraba contract, the person or party who acts as entrepreneur.
<i>Muqaradah</i>	Another name for Madarabah.
<i>Muqayyadah</i>	Restricted partnership.
<i>Murabaha</i>	Literally this means a sale on mutually agreed profit. Technically, it is a contract of sale in which the seller declares his cost and the profit. Murabaha has been adopted by Islamic banks as a mode of financing. As a financing technique, it can involve a request by the client to the bank to purchase a certain item for him. The bank does that for a definite profit over the cost which is stipulated in advance.
<i>Musharakah</i>	Musharakah means a relationship established under a contract by the mutual consent of the parties for sharing of profits and losses in a joint business. It is an agreement under which the Islamic bank provides funds which are mixed with the funds of the business enterprise and others. All providers of capital are entitled to participate in management but not necessarily required to do so. The profit is distributed among the partners in pre-agreed ratios, while

the loss is borne by every partner strictly in proportion to respective capital contributions.

<i>Niyyah</i>	It is the motive behind an action, and it determines the value and reward of the action.
<i>Hard</i>	Benevolent loan or interest-free loan.
<i>Qirad</i>	Another name for Madarabah.
<i>Quran</i>	It is the Muslim's Holy text, believed to be direct revelation from Allah (God) to Prophet Muhammed (Peace Be Upon Him).
<i>Rabul- Mal</i>	In a Mudaraba contract the person who invests the capital.
<i>Riba</i>	Any form of excess compensation or unfair advantage obtained from a loan or exchange of goods.
<i>Salam</i>	A type of sale in which price is paid in advance and goods or services are delivered later.
<i>Shirka</i>	Partnership.
<i>Shirkatul-al-Milk</i>	Joint-ownership partnership.
<i>Shirka-ul-inan</i>	One of the forms of partnership in which partners can contribute unequal capital amounts.
<i>Shirlatul-al-Aqd</i>	Contractual partnership.
<i>Sukuk</i>	A financial certificate representing ownership in a defined asset(s).
<i>Sunnah</i>	The teaching and practices of Prophet Muhammad (PBUH), including words, actions and tacit approvals.
<i>Ummah</i>	Community, a nation or people.
<i>Waqf</i>	An endowment of charitable trust in the meaning of holding certain property and preserving it for the confined benefit for a certain charitable objective and prohibiting any use or disposition of it outside that specific objective.

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Source: Mainly adopted from <https://www.zawya.com/en/islamic-economy/glossary> (MASYITA, 2012).

# CHAPTER 1

## INTRODUCTION

### 1.1 Research Background and Motivation

Small and medium enterprises (hereafter referred to as SMEs) have always been recognised as significant drivers and strong pillar for economic development across all eras of human existence (North, 1990). While the current conceptualisation of SMEs is mainly a 20<sup>th</sup> century phenomenon Wilkins (2000) SMEs have existed in antiquity and form the core of early economic systems (Epstein,1998). Historically, the evolution of SMEs could be traced back to the earliest civilisations (Wilkins, 2000). Before the Industrial Revolution of the mid-18th century Ashworth (2017) societies lacked the means and the infrastructure necessary for large-scale production. During this time, SMEs fulfilled nearly all human needs from daily consumption to goods production and services (Bebusiness.com 2025). These pre-capitalist enterprises were predominantly family-run, operated with limited labour and capital, and functioned within informal governance structures and confined to local markets (Storey,1994: Audretsch and Thurik, 2001).

The advent of the Industrial Revolution in the mid-18th century, followed by subsequent economic transformations, shifted the role of SMEs from central players in early economies, to the periphery during industrialisation, and then back to prominence in modern global markets (Piore and Sabel, 1984; Fitzgerald et al, 2023). The evolution of SMEs can thus be understood through changes in production methods, institutional frameworks, and market environments (North, 1990). Today, many large multinational conglomerates began as small businesses and gradually evolved into the major enterprises they are today. This reflects the natural progression of business development. As such, SMEs remain the oldest and most dominant form of business establishment worldwide, accounting for over 90 percent of all formal business entities (World Bank, 2022).

According to research by the International Finance Corporation and McKinsey, there are an estimated 420 to 510 million formal and informal SMEs globally, with approximately 365 to 445 million located in developing economies (Word Bank, 2018). SMEs are the primary source of employment in developing and emerging markets and contribute over half of the GDP in developed countries (United Nations, 2020). Furthermore, World Bank data indicates that

SMEs account for about 70 per cent of the formal labour force and generate more than 50 per cent of global GDP (World Bank, 2020; World Bank, 2022).

SMEs remain a crucial component of the global economy, driving growth, employment, and innovation across various regions. In Africa, a significant portion of SMEs operate within the informal sector, which has seen notable growth in recent years. According to Mintah and Darkwah (2018) the informal sector plays a pivotal role in many African economies, contributing over 50 per cent to GDP and generating more than 60 per cent of employment (Mwanza and Benedict, 2018). In Sub-Saharan Africa alone, there are approximately 44 million SMEs, responsible for over 80 per cent of job creation (APET secretariat, 2022). Asia also demonstrates the economic significance of SMEs, where they constitute 95 to 98 per cent of all enterprises. These businesses contribute on average approximately 62 per cent to national employment and 42 per cent to GDP (Yoshino and Taghizadeh, 2018).

The European Union reports similar trends, with SMEs comprising 99.8 per cent of its 23 million enterprises primarily in the non-financial services sector and generating more than two-thirds of total employment (European Investment Bank Group, 2022). In North America, the presence of SMEs is equally prominent. Canada and the United States host around 1.041 million and 33.2 million SMEs, respectively. These firms employ a significant portion of the private sector workforce, about 88 per cent in Canada and 46.6 per cent in the U.S (Innovation Science and Economic Development Canada, 2022; SBA, 2022). Beyond their economic impact, SMEs are instrumental in fostering innovation and entrepreneurial development. They are often seen as experimental grounds for entrepreneurship and as platforms for radical innovation (Jiang et al, 2018; Asad et al, 2018; Yan, 2022). Innovation is widely recognised as a foundational element of economic development Amini Sedeh et al (2021) and SMEs are increasingly embedding it into their products, services, processes, and organisational structures to boost competitiveness and adaptability (Asad et al, 2018; Yan, 2022).

The enduring economic importance of SMEs across the globe has made their financing challenge a key area of academic and policy discourse (Huang et al, 2021a; Xuan et al, 2020). As the earlier data demonstrates, the role of SMEs in sustaining modern economies is not a relic of the past, but a present-day economic reality. This affirms the widely held view that SMEs are central to global economic growth and development. Yet, despite this recognition, access to finance remains one of the most significant obstacles faced by SMEs worldwide. The World Bank estimates that more than 70 per cent of SMEs lack access to adequate financial services, with a staggering global financing gap of over USD 8.1 trillion (World Bank, 2022;

Bruhn et al, 2017). This funding shortfall continues to hinder the capacity of SMEs to start, expand, and scale their operations. Addressing this challenge has become a global priority. Literature increasingly reflects calls for collaborative efforts and innovation to improve access to finance for SMEs. In response, various initiatives have been introduced at the national, regional, and international levels to provide innovative financial solutions. For instance, Disse and Sommer (2020) report that the World Bank has committed over USD 4.8 billion in SME financing projects across 47 countries, complemented by global frameworks such as the G20/OECD High-Level Principles on SME Financing. In Europe, the European Investment Bank Group has provided more than €45 billion in financing to over 431,000 SMEs, helping to sustain around 4.5 million jobs (European Investment Bank Group, 2022). Similarly, the African Development Bank, through its Africa SME Program, has allocated USD 125 million to financial institutions for onward lending to SMEs across the continent (AfDB, 2023). Despite these substantial efforts, limited access to finance remains the most frequently cited barrier to SME growth (World Bank., 2017). The persistent nature of this problem continues to draw the attention of scholars, policymakers, and development practitioners who are working to bridge the financing gap and ensure that SMEs can fully realise their economic potential.

In the context of The Gambia, access to finance remains a significant barrier for SMEs. According to the Ministry of Trade, Industry, Regional Integration and Employment (MoTIE, 2020), over 80 per cent of Gambian SMEs lacked access to loans in 2018. More recently, Jallow (2023) reaffirmed that limited access to finance continues to pose a major challenge to the growth and sustainability of SMEs in the country. The situation in The Gambia reflects broader issues across the African continent. For instance, Ikechukwu et al (2023) note that beyond financial barriers, SMEs in Africa are also constrained by factors such as limited managerial and entrepreneurial capacity, inadequate infrastructure, and unreliable electricity supply etc., all of which are relevant to the Gambian SME environment.

Recognising these challenges, The Gambian government has committed to strengthening the financial sector as part of its broader strategy for economic transformation. The National Development Plan (GNDP, 2025) articulates the government's intention to remove financing barriers for the private sector, particularly targeting agriculture, women, and youth. It also underscores the importance of innovative financing as a key enabler of development. According to the GNDP (2025 p.23) 'to ensure the successful implementation of the National Development Plan, critical focus must be anchored on alternative and more innovative ways of financing. Public-private partnerships, capital markets, blended finance, among other means,

will be explored as priorities to ensure sustainability and efficiency, especially considering the modern economy and the global financing agenda of moving away from overdependence on aid'. This strategic direction highlights the government's recognition that sustainable SME growth requires not only policy reform but also diverse and modern innovative approaches to financing.

Mainstream conventional financial institutions have not been particularly effective in addressing the financing challenges faced by SMEs globally. These institutions operate on a risk-transfer model, which tends to exclude SMEs due to their typical characteristics such as insufficient credit history, inadequate collateral, poor record-keeping, and limited managerial expertise, making it difficult for them to establish their creditworthiness. Consequently, financial institutions often view SMEs as high-risk borrowers, and therefore not qualify for loans (Huang et al, 2014).

Modern Islamic finance has emerged as a potential alternative to conventional finance, offering risk-sharing or participatory financing models that in theory, align better with the financing needs of SMEs. These Islamic participatory modes such as *Mudarabah* (profit-sharing), *Musharakah* (joint venture) and *Musharakah Mutanaqisah* (Diminishing Musharakah) are often highlighted as the core principles of modern Islamic finance and are rooted in ethical principles (Ali et al, 2018; Iqbal and Mirankhor, 2011). However, in practice, these instruments are not widely adopted by Islamic financial institutions. This limited adoption is primarily attributed to issues such as a lack of trust in SME business partners and insufficient entrepreneurial capacity among SME clients etc. Supporting this claim, Zafar and Nor (2019) assert that trust deficits between IFIs and SME borrowers significantly hinder the uptake of participatory financing. Similarly, Islam and Ahmad (2020) find a direct and positive correlation between SME entrepreneurs' skillset and the likelihood of accessing Islamic participatory finance. Folajinmi and Peter (2020) further argue that strong financial management skills among entrepreneurs facilitate the use of such financing models by IFIs.

In parallel, contemporary literature has increasingly focused on innovative approaches to address SME financing constraints. For instance, Miliūnaitė (2023) explored the use of artificial intelligence and alternative data to evaluate SME credit risk. Nayak (2023) proposed the integration of machine learning and data mining techniques into credit scoring and risk assessment models tailored for SME lending. These emerging tools signify a growing academic and industry interest in modernising the methods used to assess SME creditworthiness. One pioneering effort in this domain comes from the Entrepreneurial Finance Lab at Harvard

University, whose research team explored the use of psychometric screening as a means of evaluating SME loan applicants. Their findings demonstrated that psychometric tools can significantly improve SME access to finance by offering alternative means of risk assessment (Klinger et al, 2013).

In response to the growing call for innovative financing mechanisms to support SMEs and foster inclusive national development, Badjie (2019) explored the application of Islamic blended financing to address the funding challenges faced by SMEs in The Gambia. Her thesis adopted a financial engineering approach to design financing products that integrate the motives of compassion, profit, and facilitation, corresponding to philanthropic, commercial, and public sector activities, respectively. The objective was to create incentive-compatible financing structures capable of mobilising resources for socially responsible and economically impactful SMEs, while simultaneously reducing costs and generating revenue for long-term sustainability. The study concluded that Islamic blended finance particularly its philanthropic component acting as a social subsidy could alleviate the burden of high commercial interest rates on SMEs. Additionally, such a structure could help de-risk SME financing, enhance investor perception, and contribute to broader economic growth.

Building on this innovative foundation, the present research proposes the use of psychometric evaluation and data mining techniques to promote the adoption of Islamic participatory modes of financing for SMEs, taking The Gambia as a case study. The Islamic participatory financing modes are considered particularly well-suited to SME development due to their risk-sharing nature. However, they remain underutilised due to trust issues and challenges in assessing the skillset of entrepreneurs. This study posits that combining psychometric tools and data mining as novel screening mechanisms can support the Islamic financial institutions in identifying reliable and capable SME partners in using the participatory financing modes. By addressing key informational and perception barriers, this approach aims to facilitate the effective deployment of Islamic participatory finance and thereby support inclusive, shared economic development. In this context, the present research contributes to the growing body of literature exploring innovative SME financing models. By focusing on The Gambia as a case study, it seeks to offer practical insights into how alternative assessment tools can bridge financing gaps and unlock the full potential of SMEs in emerging economies.

## 1.2 The Research Problem Statement

A persistent paradox within the global development discourse is the fact that SMEs are widely acknowledged as the engines of economic growth, yet they remain the most financially constrained business units. Despite their critical role in job creation and poverty alleviation, SMEs continue to face significant challenges in accessing finance. This issue has become a central theme in both academic research and development policy discussions. Financial constraint, defined as the inability to access or benefit from financial resources Agostino et al (2008) arises from both demand- and supply-side challenges (Moscalu et al, 2020). Access to finance is a key determinant of business success and sustainability Cummings et al (2020) yet, securing financing has long been a major hurdle for SMEs (Choudhury, 2015). As Githui (2012) concluded, the primary difference between successful and failed SMEs often lies in their ability to obtain financing.

The lack of access to finance continues to inhibit the creation, growth, and survival of SMEs (Chandra et al, 2020). Current estimates show that more than 70 per cent of global SMEs are financially excluded, while another 15 per cent are underserved by existing financial institutions (World Bank, 2022). The global SME financing gap is estimated at over USD 8.1 trillion annually (World Bank, 2022; Bruhn et al, 2017). This financing shortfall is particularly concerning given the critical social and economic contributions of SMEs. As Fiseha and Oyelana (2015) emphasise that, SMEs play a crucial role in creating employment, especially in rural areas, and help address poverty and inequality by including marginalised populations such as women, persons with disabilities, and those with limited formal education. The World Bank projects that by 2030, more than 600 million jobs will be needed globally, with SMEs expected to create 80 per cent of them mainly in developing regions like Asia and Sub-Saharan Africa (World Bank, 2022).

Research has shown a strong link between access to finance and SME productivity, especially in sectors such as manufacturing (Valentine, 2014; Subhanij, 2016). However, SMEs are often perceived as high-risk borrowers due to their small size, lack of collateral, inconsistent record-keeping Berger and Udell (1998) and Gregory et al (2005), and limited credit history (Ryan et al, 2014). Traditional financial institutions, which rely heavily on credit risk assessments and require extensive documentation, tend to avoid lending to SMEs due to the information asymmetry and the higher cost of administering small loans (Arraiz et al, 2014).

In contrast, modern Islamic finance with its participatory financing models presents a promising alternative for financing SMEs. Unlike conventional finance, which is based on risk transfer and interest-bearing loans, Islamic finance emphasises risk-sharing through equity-based contracts such as *Mudarabah* and *Musharakah* as well as *Musharakah Mutanaqisah*. These modes distribute risks and rewards between the financier and the entrepreneur Ahmed and Aassouli (2022) making them particularly well-suited for SMEs and startups that typically lack assets for collateralised loans (Hassan, 2015). These arrangements reward capital only when the business succeeds, thereby shifting the focus from collateral to entrepreneurial capacity and integrity (ElGindi et al, 2009). However, in practice, Islamic financial institutions have shown reluctance to fully implement participatory financing models mainly due to concerns about entrepreneur's moral conduct, managerial competencies and skillsets, and the general lack of transparency in privately held businesses such as SMEs (Zafar and Nor, 2019; Islam and Ahmad, 2020; Folajinmi and Peter, 2020). This has limited the potential of Islamic finance to support the SME sector in a meaningful way. Despite the ideological appeal of participatory contracts, IFIs have historically favoured debt-like instruments such as *Murabaha* (cost-plus financing), due to their lower operational complexity and risk. However, this trend has been criticised for deviating from the foundational principles of modern Islamic finance.

### **1.3 Research Aims, Objectives and Research Questions:**

Against the backdrop of the preceding discussions, this research aims to explore the use of psychometrics and data mining as innovative screening mechanisms to promote the use of Islamic participatory modes of financing. The research seeks to demonstrate how modern tools such as psychometrics and data mining can be used to enhance risk assessment, strengthen operational decision-making, and expand access to participatory Islamic finance for underserved entrepreneurial populations such as SMEs. The objective is to help IFIs better distinguish between SME entrepreneurs who possess both viable business opportunities and the moral and managerial qualities necessary for responsible partnership and those who do not. By enhancing the selection process, this study seeks to encourage broader adoption of Islamic participatory financing for SMEs, thereby contributing to the reduction of financing constraints and supporting more inclusive and sustainable economic growth. Hence, the specific research objectives of this dissertation are given below:

1. To examine the relationship and impact of SME entrepreneur characteristics and firm attributes on overall firm performance.

2. To identify and analyse the key factors that influence the Islamic Financial Institutions' decision to deploy the Islamic participatory modes of financing for SMEs.
3. To explore the potential benefit of utilising psychometric assessment and data mining techniques in facilitating the adoption of Islamic participatory modes of financing for SMEs.
4. To develop actionable recommendations informed by research outcomes that can enhance the application of the Islamic participatory financing models among SMEs.

To achieve the research objectives, the study will address the following research questions:

1. What is the relationship between SME entrepreneur characteristics, firm attributes, and firm performance?
2. What are the key factors that influence Islamic Financial Institutions' decision to deploy the Islamic participatory modes of financing for SMEs?
3. Can psychometric assessment tools and data mining techniques facilitate the adoption of Islamic participatory financing modes among SMEs?
4. What strategies can be employed to increase the uptake and application of Islamic participatory financing, particularly among SMEs?

## **1.4 Research Scope**

The scope of this research is primarily focused on evaluating the potential of using psychometric analysis and data mining in promoting the application of the Islamic participatory modes of financing for SMEs, with The Gambia as a case study. In terms of the thematic focus, the research is cross-cutting and interdisciplinary including Islamic finance, behavioural economics, financial technology, and SME development etc. The research specifically focuses on the application of psychometric testing and data mining as innovative screening techniques of SMEs in the context of applying the Islamic equity and equity-like financing arrangements. These tools are investigated as potential mechanisms to mitigate the challenges of information asymmetry, lack of credit history, and perceived high risk that are inherent to SMEs and that typically deter the Islamic financial institutions from offering participatory finance to SMEs.

The research is also not exhaustive in terms of the Islamic finance products, but rather is limited in its focus on the Islamic participatory modes and excludes debt-like instruments like Murabaha, Ijarah, Salam etc. Likewise, although the research references fintech application and alternative scoring technique through data mining and psychometrics, the study only evaluates their conceptual applicability, operational viability and strategic integration within

Islamic finance ecosystem, but excludes technical designs or the software developments of the classification algorithms used in the data mining segment.

Geographically, the research is limited to The Gambia which presents a unique case with its majority Muslim population, increasing adoption of mobile technology and digital platforms as well as growing demand for Islamic finance products especially by the SME sector. This context provides a unique opportunity to explore how Islamic finance innovations can address the financing needs of the underserved enterprises such as SMEs. Thus, the research findings will be relevant for the other developing and emerging countries with similar socio-economic structures such as The Gambia.

The research is also limited in its scope by looking at the microfinance institutions which are ideally suited for financing SMEs. Thus, in summary, the scope of this study is carefully delineated to focus on the potential integration of psychometric and data-driven assessment tools into Islamic participatory financing models for SMEs within The Gambian context. While the thematic, geographic, and institutional boundaries are clearly defined, the study offers insights with potential applicability beyond its immediate context, particularly for similarly structured economies seeking to enhance inclusive, ethical, and sustainable financial systems through Islamic finance innovations.

### **1.5 Rationale and Motivation of the Study.**

This research is motivated by both academic inquiry and personal engagement with the socio-economic realities of The Gambia. As a researcher originating from The Gambia with a background and strong interest in Islamic finance, the study is informed by a lived awareness of the structural challenges facing SMEs, particularly in relation to access to finance, informality, and institutional constraints. The Gambian economy is characterised by a high dependence on SMEs, many of which operate within informal settings and rely heavily on social networks, community trust, and non-formal financing mechanisms. Despite the country's predominant Muslim population and the theoretical alignment of Islamic finance with ethical and inclusive economic principles, the practical application of Islamic participatory financing modes such as *Mudarabah* and *Musharakah* remains limited. This divergence between theory and practice presents a compelling area for investigation.

From a personal and intellectual standpoint, this research emerges from a critical observation in which Islamic finance is often promoted as a solution to financial exclusion, while its implementation in developing contexts like The Gambia is constrained by deeper structural

issues, including weak institutional frameworks, limited financial literacy, and challenges in assessing entrepreneurial quality amongst others. These realities raise important questions about whether the limitations lie within the financial models themselves, or within the systems in which they are embedded. Furthermore, exposure to the growing body of literature on financial technology, particularly psychometric testing and data-driven credit assessment, provided an opportunity to explore innovative approaches that may complement Islamic finance principles. The integration of behavioural insights with financial decision-making presents a promising avenue to address long-standing issues such as information asymmetry and moral hazard, which are particularly pronounced in SME financing.

This study is therefore driven by a dual motivation. First, it seeks to contribute to academic discourse by bridging gaps between Islamic finance theory, behavioural economics, and financial technology. Second, it reflects a practical aspiration to develop contextually relevant solutions that can enhance SME financing in The Gambia. In this sense, the research is not merely a technical exercise, but a contextually grounded inquiry aimed at understanding and addressing real-world challenges within a specific socio-economic and cultural setting. Importantly, this positionality also aligns with the philosophical stance of the research. While the study adopts a post-positivist and critical realist approach in its empirical analysis, it recognises that knowledge production is influenced by the researcher's context, experiences, and values. As such, the research consciously engages with the interplay between objective measurement and socially embedded realities, particularly within the framework of Islamic economic thought and the lived experiences of SME entrepreneurs in The Gambia.

## **1.6 Research Significance**

Looking at psychometric tools as advanced measurement tools of an individual's cognitive abilities, personality traits, motivations, and behaviour, thus, in the context of SME financing, psychometric assessments can be used to evaluate the non-financial indicators of creditworthiness, such as integrity and trustworthiness, entrepreneurial aptitude, risk appetite and resilience, work ethics, conscientiousness etc. These traits are particularly relevant for Islamic participatory financing, which require a higher degree of trust and partnership between the financier and the entrepreneur. For data mining, it refers to the process of discovering meaningful patterns, trends, and relationships within large datasets. In the context of SME financing, it can be used to analyse various structured and unstructured data points ranging from business transactions, social media behaviour, utility payments, mobile phone usage, and alternative digital footprints to assess creditworthiness and entrepreneurial potential. By

leveraging data from non-traditional sources, IFIs can make informed decisions even in the absence of audited financial statements or formal credit records, which are often unavailable in the SME sector. This significantly reduces information asymmetry, which is one of the primary barriers to participatory financing.

Furthermore, the integration of psychometrics and data mining also aligns with the objectives of Islamic finance, by enabling a fairer and more inclusive access to capital, particularly for marginalised and underbanked entrepreneurs. These screening approaches will support financial justice which is a core value of Islamic finance. The Islamic participatory modes of financing require financiers to act as genuine partners in the business, sharing not just profits, but also risk and responsibility and advanced screening tools such as psychometrics and data mining will allow IFIs to uphold this spirit, by identifying partners who are both competent and trustworthy, thus promoting more ideal applications of modern Islamic finance as an alternative model. Thus, by enabling more accurate, inclusive, and values-aligned screening and monitoring of SMEs, psychometrics and data mining can help actualise the potential of Islamic finance as a truly ethical and developmental financial system, especially in developing contexts like The Gambia, where SMEs are critical to economic transformation. In sum, the significance of this study could be understood from the below thematic areas:

### **1.6.1 Theoretical and Academic Significance**

This study promotes an interdisciplinary approach to solving development issues such as SME financing constraints. The combination of Islamic finance, behavioural finance (psychometrics) and data science (data mining), to ameliorate the financing constraints of global SMEs represent a striking innovation in the risk assessment models for SMEs. The study contributes to academic literature by looking at the use of non-traditional tools like psychometric and data mining to revive the classical Islamic contracts like the *Mudarabah* and *Musharakah*. Likewise, although there is an abundant literature on SMEs financing constraints and the use of psychometric in the credit risk assessment of SMEs has been pioneered by the Entrepreneurship Finance Lab team of researchers at Harvard University since 2013. However, to the best of the researcher's knowledge, this study is one of the pioneering efforts, to examine the potential of psychometric together with data mining in promoting the use of specific Islamic financing modes such as the participatory modes.

Moreover, the study contributes to the long-standing academic debate on the limited use of the Islamic participatory modes as the core distinctive modes of modern Islamic finance and

strengthens the understanding of how these modes might be implemented within a high-risk environment with enhanced screening and thus move Islamic finance from interest avoidance debt-based instruments towards its ethical foundation and envisioned goal of providing equitable and risk-sharing financial intermediation.

### **1.6.2 Practical or Industry Significance**

With the obvious credit rationing of the global SMEs, the practical significance of this study for the Islamic finance institutions and the equity financiers generally, lies in its potential to address real-time challenges like entrepreneur's honesty, skillset, perseverance, risk tolerance, inadequate data etc., in deploying equity and equity-like financing instruments. It thus provides a more comprehensive and transformational approach towards SME financing decisions by financiers. Furthermore, this SME screening approach offers a low-cost scalable tool for assessing SMEs in the face of limited variable data. This will allow IFIs to break the barriers and enter territories that where inter alia seen as unchartered and deploy participatory financing with high degree of confidence.

From an operational standpoint, this approach will benefit from cost reduction stemming from process automation and facilitates fast decision-making by reducing information asymmetry especially in dealing with the informal entrepreneurs where most SMEs belong. Furthermore, with the heavy reliance of the Islamic finance industry on the debt-like instruments which often is a point of contention for most modern Islamic finance critics, this screening approach has the potential to support diversification in the product offerings of IFIs by promoting the adoption of Islamic participatory modes. Similarly, the use of psychometric analysis and data mining and many other emerging technologies will help to provide a practical framework of integrating fintech solutions in the operations of IFIs and facilitate a step toward the digitisation of Islamic finance, making it more accessible and responsive to the needs of SMEs.

### **1.6.3 Economic and Development Significance**

Considering that SME financing constraints as a major area of the study, hence, the economic and development significance of this study lies in its potential to break the systemic barriers in providing adequate and appropriate financing to SMEs. The application of novel and transformational assessment methodologies such as the use of non-traditional techniques like psychometric analysis and data mining, and focusing on the use of Islamic participatory modes, naturally broadens the financing base for SMEs. Since the elements required for traditional financing are virtually unavailable for SMEs, this approach represents an alternative

mechanism and will lead to a more efficient allocation of capital and stimulate productive activity in underfinanced sectors such as the SME.

Moreover, by bring the Islamic participatory modes into the realms of financing options for SMEs, the study will help to revive and push modern Islamic finance to pivot towards its foundational aspirations and facilitates the achievement of the economic objectives of Shariah which include wealth circulation, socio-economic justice, and financial empowerment of marginalised groups such as SMEs, youth and women and thus contribute to broader goals of poverty reduction and economic empowerment. Furthermore, the availability of financing especially risk finance will enable domestic production and will help provide a resilient domestic economy. From a development standpoint, improved access to financing for SMEs will translate into more job creation, enhancement of entrepreneurship and innovation, business expansion etc., which aligns with the broader international goals of poverty reduction, reducing inequalities as well as the promotion of decent work and economic opportunities. The research offers a dual contribution to economic and human development by proposing a model that enhances financial access, promotes ethical investment, and supports inclusive growth. It highlights the transformative potential of aligning Islamic finance principles with contemporary data science methodologies to build a more just, resilient, and opportunity-rich economy.

#### **1.6.4 Socio-Cultural, Ethical and Policy Significance**

The socio-cultural norms and values, as well as religious practices and beliefs of people, have a deep influence on their financial behaviours. Voluntary exclusion is already a major factor in many Muslim-majority countries due to the nonalignment of the dominant financial loan product with their faith. This informs the need for financial products that align with Islamic ethical teachings and social expectations. Thus, using the Islamic participatory modes which are anchored on mutual responsibility, cooperation and shared risk, not only reflect the orthodox Islamic economic practices, but also responds to the gap left by the religious and culturally sensitive segment of society that is left unserved or underserved. Likewise, Islamic participatory financing models with their risk-sharing mechanisms when implemented effectively, aligns well with the wealth protection economic objective of Shariah and are more ethically grounded than the debt-base models that effectively transfer the risk to the weaker party hence become less ethical and unjust. This ethical foundation distinguishes Islamic participatory finance from exploitative lending practices that can deepen debt cycles and exacerbate social inequalities.

The study has several policy significances. For instances, it could serve as reference framework for the development of financial inclusion policies using non-traditional tools to expand outreach to the underserved SMEs especially in rural and informal sectors. This will encourage regulators to be more receptive to innovative solutions to our contemporary development challenges. Similarly, the findings and the recommendations of this research could also be incorporated into national policies to increasing access to finance for marginalised groups like SMEs, youth and women to promote entrepreneurship. Meanwhile, the study would also trigger a resit on the scope and guidelines for Shariah advisory and standard setting bodies as new technologies are used in the Islamic finance operations. In summary, the study's socio-cultural, ethical and policy significance are far-reaching. It contributes to the rethinking of how Islamic finance can be effectively localised and democratised using culturally respectful, ethically grounded, and technologically enabled tools, and thus offers practical insights for designing financial systems that are not only economically effective but also socially and morally just.

## **1.7 Overview of Research**

This research is organised into ten distinct yet interconnected chapters. Each chapter focuses on a key component of the study, including the identification of the research problem, the formulation of research objectives and questions, and the analysis of research findings. The final chapters present the conclusions drawn from the findings and offer relevant recommendations. The structure of the research is outlined as follows:

**Chapter One:** This chapter lays the foundational context and motivation for the research. It presents the background of the study, clearly articulates the research problem, and outlines the research aim, objectives, and questions. Furthermore, it discusses the significance of the study from socio-cultural, economic, ethical, and policy perspectives. The chapter concludes by defining the scope of the research and providing an overview of the structure of the entire dissertation.

**Chater Two:** This chapter presents a critical review of existing literature to situate the research within the broader academic discourse. It begins with an in-depth exploration of the definition and evolution of Small and Medium Enterprises, followed by an examination of their economic significance. The chapter then delves into the financing constraints faced by SMEs and investigates the underlying causes of these challenges. It concludes with a review of various SME financing models and the diverse sources of finance available to SMEs.

**Chapter Three:** Building on the discussion of the limitations of conventional financing for SMEs presented in the previous chapter, this chapter explores Islamic participatory financing modes as a potential alternative. It begins by outlining the theoretical framework underpinning the research, followed by an analysis of the relationship between Islam, entrepreneurship, and entrepreneurial finance. The chapter critically examines various Islamic participatory modes and assesses their suitability for SME financing, while also acknowledging the challenges associated with their application. To address these challenges, a proposed solution looking at integrating psychometrics and data mining techniques was presented with empirical evidence. The chapter concludes by presenting the conceptual framework developed from both theoretical insights and empirical findings.

**Chapter Four:** As a matter of significance, this chapter presented a snapshot of the environment under which the study was conducted. This study uses The Gambia as a case and thus the chapter presents the political, economic and financial systems, as well as the Islamic finance development of the country. The chapter also briefly highlights the Gambian understanding SMEs and SME financing and concludes with a summary issues covered.

**Chapter Five:** This chapter outlines the research design and methodological approach used in the study. It details the research paradigm, population and sampling techniques, data collection instruments, and methods of data analysis. The chapter also addresses ethical considerations in research data collection instrument, validity and reliability measures. The chapter concludes with a list of some existing scales adapted in the development of the research instrument.

**Chapter Six:** The chapter begins the analysis of the research data with comprehensive descriptive statistical analysis. The chapter covers data entry and coding, frequency analysis, correlation analysis and ends with deep dive into the entrepreneur demographic and firm profile analysis.

**Chapter Seven:** This chapter contains the results of the data analysis for the first empirical chapter on psychometric testing. It captures the results of psychometric analysis via multiple regressions including the reliability and validity assessments of the instrument. The chapter contains a total of six models covering key areas including establishing the financial viability of the investment opportunity, establishing SME operator's trustworthiness as proxy of addressing the impending moral hazard issues and the subsequent decision of IFIs to finance based on Islamic participatory modes or not.

**Chapter Eight:** In this chapter, the second empirical analysis on data mining with classification was presented. It begins with an overview of data mining, decision trees and snapshot description of the classification algorithms used in the analysis including the software package used. It presents the results of the various classification algorithms utilised on the research data, including the software used for the analysis.

**Chapter Nine:** This discussions on the results presented in the preceding two chapters and interprets the research findings considering the research questions and the existing literature reviewed in chapter two. The discussion mirrors the chronology of the empirical analysis, starting with the descriptive analysis of the research data, then to the empirical results of the regression analysis and finally ends with the data mining results of classification. The chapter also contains analysis of the hypothesis testing and comparative analysis of results from the empirical results.

**Chapter Ten:** As the concluding chapter, it carries the overall conclusion drawn from the research findings, and reflects on their implications for theory, practice, and policy. The chapter offers some practical recommendations for Islamic finance institutions, policymakers, and other broader stakeholders. The chapter also highlights the limitations of the research and suggests areas for further research.

## **1.8 Conclusion**

This chapter presented the context and foundation of the research with a comprehensive overview of the background and motivation of the research. It has highlighted the core problems of financing SMEs with the conventional scheme. While presenting the Islamic participatory modes as better alternatives, the chapter highlighted their limited application due to institutional reluctance, lack of suitable risk assessment tools, and widespread information asymmetry particularly when dealing with SMEs in the informal sectors. This therefore informs the motivation and the overall aim of the research by investigating how modern tools such as psychometric testing and data mining can serve as effective mechanisms for expanding the utilisation of the Islamic participatory modes in financing SMEs.

Several of the research's significance have been highlighted including academic, practical, economic, policy, socio-cultural, and ethical significance of the topic, demonstrating the relevance of this research to a wide range of stakeholders, including Islamic financial institutions, policymakers, development agencies, and local entrepreneurs amongst others. In essence, the research seeks to offer a practical and innovative solution to a longstanding barrier

in Islamic financial practice which is the underutilisation of profit-and-loss sharing contracts in favour of debt-like instruments. By focusing on localised, ethically sensitive, and technologically relevant tools, the study aims to contribute to more inclusive and development-oriented Islamic finance systems in The Gambia and similar economies. The next chapter provides a critical examination of existing academic and empirical literature on SME financing barriers and Islamic participatory modes of finance. This will help to contextualise the research problem further and identify gaps in knowledge that this study aims to address.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Definition and Evolution of SMEs**

SMEs or small businesses, as they are called in literature do not have a standard recognised definition across all jurisdictions and institutions, and this has been identified by researchers such as Balkenhol et al (2013) as one of the major constraints faced by SME entrepreneurs today. For instance, Rutashobya and Olomi (1999) documented more than 50 different definitions of SMEs in over 75 different countries around the world. This absence of a universally accepted definition has prompted countries and international organisations across the world to contextualise their definition of SMEs. Therefore, what is an SME, depends on who defines it and for what purposes (Bawa and Gunapalan, 2012). In this regard, the Waitron report of (1966), upholds that, the pursuit of a unified definition for SMEs that is valid across all sectors and at all times is a myth and a futile endeavour, as the definition of an SME needs to be sensitive to the context and policy objective at hand, arguing that the nature of the economic measured envisage should determine the contours of this definition (Madani, 2018). Meanwhile, adding to the discourse Gibson and Vaart (2008) proposed a formula for the definition of SMEs. They argued that the SME definition should be a function of their functional and behavioural attributes which accommodates country-level specificities. This approach accommodates the diversity of economic environments while providing a more adaptable framework for categorising SMEs.

The definition of SMEs varies widely, and it incorporates both quantitative and qualitative measures. A common quantitative approach involves assessing the size of the business which is measured by variables such as asset value, annual turnover, number of employees, and profit levels amongst others. From this standpoint, the definition is understood from two distinct points i.e., economically, and statistically. From the economic viewpoint, variables such as the business market share, its management (i.e. fully or partly owner-managed), and its legal status (i.e., independent and not a subsidiary or part of a bigger company or group of companies) are considered. Statistically, the definition considers the contribution of the business to GDP, employment creation, the relative contribution of the SME business sector overtime, and the relative contribution of the business from a cross-country comparison perspective (Abor and Quartey, 2010).

Aside from the use of statistical criteria for defining SMEs which are basically quantitative, there have been attempts to define SMEs along the qualitative angles as well. SMEs could be differentiated from large companies by looking at their management structure, legal status, calibre of staff, source of funding, production system i.e., whether capital or labour intensive etc (UNIDO, 2004, Yon and Evans, 2011). Schaper (2014) further elaborates that SMEs are typically independently owned, owner-managed, and financed by the owner, who also serves as the chief decision-maker. These enterprises usually hold a limited market share and operate within narrow scopes of activity. Meanwhile, it is a lot easier to distinguish between SMEs and larger in practice using the qualitative dimensions than the quantitative dimensions, most of which lack uniformity across institutional, national, and even industrial considerations. Stokes and Wilson (2010) asserted that SMEs are easily differentiated from large firms once their operations are observed.

Since the consideration of a standard definition of an SME is sought due to their economic relevance such as contribution to the economy, employment creation, policy initiatives such as tax, funding support etc., thus, defining them along the qualitative dimensions will certainly fall short of expectations of the desired policy objectives. Hence, the independent consideration of the qualitative measures in defining SMEs will be flawed and insensible. Hence, Sofia and Jianguo (2016) argued that a more plausible and comprehensive approach to defining SMEs is by combining quantitative and qualitative criteria. Jallow (2019) citing Hussein Kakembo et al (2021) pointed out that, defining SMEs based on quantitative measures like number of employees, asset size and annual sales or turnover is a dominant trend in the literature. Thus, International organisation such as the European Commission, United Nations Development Program and other Multilateral Development Banks such as the African Development Bank, Asian Development, all define SMEs primarily along the above quantitative measures.

Modern academic scholarship offers a range of theoretical explanations for the evolution of small businesses globally. Some scholars argue that SMEs emerged as a direct outcome of deliberate governmental policy and economic initiatives, while others suggest that their development is rooted in the failures of foreign development programs implemented by governments and international organisations, particularly in the developing and emerging economies. For instance, the labour supply theory posits that, the presence of surplus unabsorbed labour from the economically active population, led to the creation and evolution of SMEs especially in the informal sectors of developing countries (Matsongoni and

Mutambara, 2018). This depicts situations where the formal economy fails to generate sufficient employment opportunities and individuals often turn to small-scale enterprises as a means of livelihood.

Another notable theory is the Legal Theory of SME evolution. The legal theory of SME evolution claims that, due to the heavy and costly legal requirements in other businesses, SME becomes the easiest and ideal type of business for most people to operate, since the requisite requirements are not very difficult to fulfil compared to large formal firms (Jamela, 2013). Similarly, scholars such as Matsongoni and Mutambara (2018) reinforces this idea. They argue that the burdensome legal and tax requirements of formal businesses, combined with stringent regulatory frameworks, have driven many individuals especially in developing countries to pivot towards informal SME activities. These ventures, often operated for subsistence purposes, provide entrepreneurs with greater autonomy, minimal regulatory interference, and lower operational costs. Furthermore, in the 1940s, the notion of SME was encapsulated into the development landscape by many national governments through targeted policies such as grants, subsidised credit, special tax treatments etc., and the establishment of dedicated support institutions for SMEs. For instance, in 1948, Japan established a publicly funded SME agency to support SMEs and similar initiatives emerged in the US, India, Tanzania, and Turkey in 1953, 1954, 1966 and 1976 respectively (OECD, 2004).

The contemporary evolution and the proliferation of SMEs on the African continent could largely be attributed to two key factors namely, staggering unemployment and the failures of the foreign economic and development programs. In the post-colonial era, many African governments implement deliberate educational policies such as free and mandatory primary education to improve literacy rates to build human capital. Meanwhile, the inability of the central governments to absorb this burgeoning number of trained citizens, resulted in a significant mismatch between education and job creation. As highlighted by Karnani, (2007) people who operate SMEs and primarily borrow from microfinance institutions would prefer a steady wage job when available.

Secondly, foreign ideas and programs such as the Economic Structural Adjustment Program (ESAP) and Economic Recovery Programs imposed on most Africa countries by the Bretton Wood institutions such as the International Monetary Fund and the World Bank, created more havoc for most African countries (Mosley et al, 1991; Mkandawire and Charles, 1999). These programs were often formulated without adequate consultation with national stakeholders or alignment with the unique socio-economic needs and priorities of African countries. As a result,

they frequently failed in execution, leading to severe economic dislocations. The failure of such programs and foreign ideas mostly lead to negative economic outcomes such as labour retrenchment which sent many people into redundancy, who inevitably turn to SME operations to weather the storm of unemployment. Similarly, failures from globalisation and the poorly defined and insensitive neo-liberal policies have greatly contributed to the emergence of informal SMEs in Africa as they are often skewed in favour of market liberalisation without adequate protection for vulnerable sectors (Mosley et al, 1991; Mkandawire and Charles, 1999; World Bank, 1994).

## **2.2 The Economic Significance of Global SMEs**

### **2.2.1 Employment Creation**

Employment creation remains one of the most celebrated and impactful roles of global SMEs. SMEs provide most of all the new jobs created around the world. Estimates from World Bank indicate that over 70 per cent of the global labour force is employed by SMEs (World Bank, 2022). In fact, it is projected that by 2030, out of the 600 million jobs that would be required by the global labour force, 80 per cent of it will be in the employment of SMEs (World Bank, 2022). The contribution of formal SMEs in job creation is more pronounced in high-income and developed countries where formality is commonplace than in lower- and middle-income countries where most of the SMEs operate within the informal sector. For instance, Zafar and Mustapha (2017), conclude that, in the high-income and developed countries, the formal SMEs contribution to employment was estimated at 65 per cent, while the combined percentage for SMEs and informal enterprises in the low- and middle-income countries were 70 per cent and 95 per cent respectively. However, most SMEs in the developing countries operate in the informal sector. ILO (2015) estimates that, there is over 375 million people employed in the informal sector in over 40 countries. Muriithi (2017) citing other studies documented that, SMEs contribution to employment in Ethiopia, Uganda, Kenya, Nigeria was 90, 90, 80 and 70 per cents respectively. The study concluded that, SMEs contribute on average about 60 percent of employment in most African countries.

Without SMEs, most African countries and other developing regions of the world will experience financial and development challenges and further worsen the living standard for the low-income belt of the population who turn to SME operations as source of livelihood (Santarelli and Vivarelli, 2007). Hence, SMEs represent an all-rounded tool for shared global prosperity, peace, and economic development as they provide a source of livelihood for many

young and economically active people around the world, which is a cardinal prerequisite for having an inclusive and progressive global economy.

### **2.2.2 Contribution to GDP**

A fundamental feature of SMEs as the engines of the global economy is their unrelenting contribution to the aggregate economic output. The Gross Domestic Product (GDP) is the total monetary value of all the goods and services produced within a given period. The World Bank and the World Economic Forum both estimate that SMEs account for over 70 per cent of global GDP (World Bank, 2022; World Economic Forum, 2022). Further, SMEs account for more than 50 per cent of the productive economic activities (World Bank, 2020). Their contribution is found to be more pronounced in the manufacturing sectors of most economies where they add value in the production cycle and maintain a genuine source of input for large firms. For instance, SMEs are reported to account for over 60 per cent of all value added in the OECD countries (OECD, 2016a ). Similarly, Jinhua (2016) reported that in 2014, SMEs accounted for over 73.6 per cent of the total industrial value added in Zhejiang, China. In Africa, SMEs are reported to account for over 50 per cent of the continental GDP.

Although the contribution of SMEs to national GDPs is easily identified and accounted for in high-income and developed nations, this is somewhat blurry in developing countries due large presence of informality within the SME sector (Kamunge and Tirimba, 2014). For instance, Fjose et al (2010) concluded that in most African countries, the SME contribution from the formal sector is about 20 per cent compared to the SME contribution of 60 per cent in the developed nations. Santarelli and Vivarelli (2007) argues that without SMEs, most African countries and other developing regions of the world would experience financial and development challenges and further worsen the living standard of the low-income belt of the population who turn SMEs as a source of livelihood.

### **2.2.3 Entrepreneurship Development**

Entrepreneurship and entrepreneurial skill development are the hallmark of SMEs contribution to economic development. SME sector development has a strong link with entrepreneurship development, employment creation and poverty alleviation. Entrepreneurship entails identifying opportunities and innovatively creating new products or improving on existing products and being ready to accept the accompanying risks and rewards (Agwu and Emeti, 2014). Entrepreneurship gives people the safe space to experiment with their business ideas, while entrepreneurship competencies allow SMEs to navigate and survive the turbulent waves

of competition and other external threats to their survival and growth. Moreover, entrepreneurial skills or competencies are the set of knowledge, attitudes and skills that enable an entrepreneur to successfully and profitably develop products and services to suit the taste of their target customers (Jardim, 2021).

Entrepreneurial competency plays a mediating role between SMEs and their role in national economic development. SMEs rely on their entrepreneurial skills to navigate and conquer their external threats and gravitate towards maximising their profits and performance sustainably (Jiang et al, 2018). Thus, SMEs through entrepreneurship allow people to optimise their local resources through new venture creations and value addition. Furthermore, the utilisation of local resources by these ventures promotes entrepreneurship and builds a resilient local economy.

The adaptive nature of SMEs permits entrepreneurs to be resilient and quite easily adjust to the changing needs and taste of their clientele. A crucial component of entrepreneurial success in the SME sector is resilience. Entrepreneurship resilience is defined ‘as a form of emotional and cognitive ability that is useful for the entrepreneur, particularly when bouncing back after failures connected to their entrepreneurial initiative’ (Bernard and Barbosa, 2016 p.95). This resilience is especially critical in the developing and emerging economies, where entrepreneurs often face structural barriers, resource constraints, and market uncertainties. It is plausible to posit that there is a strong correlation between the SMEs and entrepreneurship development as well as rural development and is more profoundly in the developing and emerging countries. In these contexts, SMEs not only foster self-employment and innovation, but also serve as catalysts for, youth empowerment, and inclusive economic participation (OECD, 2017; Beck and Demirgüç-Kunt, 2006).

## **2.2.4 Facilitation of Innovation**

Innovation has been widely recognised as a key driver of SME growth, survival, and competitiveness, particularly in the context of a dynamic and globalised economy. Innovation is defined as the introduction of new product, process, or a concept in an organisation to adapt to the changing market needs or the adaptation of new ideas, methods, product, or service (Shamsuddin et al, 2017). It has also been defined as the multi-stage process whereby organisations transform ideas into either new or improved products, services or processes, to advance, compete and differentiate themselves successfully in their marketplace (Baregheh et al, 2009). Innovation not only allows the creation and entry of SMEs into the business circles,

but it becomes the lifeblood or a necessary condition for their survival and growth in this globalised era.

The inherent characteristics of SMEs such as less bureaucracy, flexibility, less capital intensive, small size etc. allow them to quickly utilise new knowledge and technologies and develop new business models and products to better serve the changing needs and tastes of their clientele. This allows SMEs to play a mediating role between innovation and entrepreneurship development. And this is by far, the primary reason why SMEs are extolled for being the breeders of innovation compared to large firms. Moreover, in this globalised era, innovation becomes a necessary element for businesses to stay afloat especially SMEs. Innovation for SMEs could either come from product or process and it could also be either radical or incremental (Saridakis et al, 2019). OECD (2005) distinguishes between four types of innovations namely, product innovation (new or improved product), process innovation (new or improved production or delivery channels), marketing innovation (new or improved product, design, packaging, promotion, and pricing) and organisational innovation (new or improved business structure, practice etc).

Exposito and Sanchis (2019) concluded that, innovations of any type i.e., (product, process and or organisation), all have a strong and positive link with SMEs performance. Several studies have highlighted the significance of SMEs in facilitating business innovation such as (Briones et al, 2018; Chatzoglou and Chatzoudes, 2018; Omri, 2015). Similarly, Asad et al, (2018) and Yan, (2022), conclude that SMEs embrace innovation to improve their competitiveness and consider it a critical element which is embedded within the firm's goods, services, processes and structure. The innovative capacity of SMEs is both a driver and an outcome of their entrepreneurial dynamism. Their adaptability and openness to innovation make them indispensable players in the contemporary global economy, particularly in advancing inclusive and resilient economic development.

### **2.3 Economics of SME Financing**

The economics of SME financing is an attempt to highlight major factors that contribute to SME financing difficulties. In the traditional lending business models, debt contracts are used to establish contractual relationships and assign obligations to both parties of a transaction. However, information asymmetry and its offshoots such as adverse selection and moral hazard could render the legal contractual stipulations ineffectual (Yan et al, 2015). Literature and empirical works have all validated the notion that smaller firms have limited access to external

finance, especially debt finance relative to their larger counterparts (Hashi and Krasniqi, 2011). Academic literature has generally condensed the SME financing challenges into major themes including information asymmetry, transaction costs and the owner and firm characteristics. It has been argued that information asymmetry is the most impeding factor that inhibits SMEs from accessing public debt and equity markets (Berger and Udell, 1998).

When lenders attempt to bridge the information gap by assessing SME creditworthiness, the costs associated with gathering accurate, credit-relevant data, tend to be disproportionately high relative to the relatively modest small loan amounts that SMEs typically seek. This high cost-to-loan ratio diminishes the economic attractiveness of lending to SMEs, especially for profit-oriented financial institutions such as commercial banks. In this context, transaction costs emerge as a direct and consequential impediment rooted in the information asymmetry problem (Bartlett and Bukvic, 2001; Ayyagari et al., 2007). Consequently, informational opacity and its related costs are the most cited factors that justify the SME financing constraints relative to larger firms (Daskalakis et al, 2013). Although in the developed economies with sound banking and financial systems where information asymmetry and costs might not become so acute as the case is in developing and emerging economies, owner and firms' characteristics have been found to impede the SME access to external finance (Quartey et al, 2017; Nizaeva & Coskun, 2017). These include factors such as the entrepreneur's education, managerial experience, ownership structure, and the firm's age, size, sector, and formalisation level.

### **2.3.1. Information Asymmetry**

Information asymmetry between SMEs and their prospective financiers is widely acknowledged to be the root cause of SME financing constraints (Huang et al C. H., 2014). The seminal works of Akerlof, (1970) and Rothschild and Stiglitz (1976) and Stiglitz and Weiss, 1981) laid the theoretical foundation for understanding the role of information asymmetry in explaining the financial constraints of SMEs in the financial markets stemming mainly from market imperfection such as credit rationing. Within the SME lending market, information asymmetry manifests in two principal forms, ex-ante asymmetry, which leads to adverse selection, and ex-post asymmetry, which gives rise to moral hazard (Huang et al, 2014).

The theory of information asymmetry postulates that parties to a transaction or any decision-making contexts, experience an imbalance in the quantity and quality of information held by either of the parties (Osano and Languitone, 2016). Holmes et al (2003) define information asymmetry as a situation in which agents (borrowers/SMEs) have information on the financial

circumstance and the prospects of the firms that is not known to the principals (banks/financiers). Similarly, Imarhiagbe (2016) defines information asymmetry as a situation in which one party to an economic transaction has better information than the other. According to the finance gap hypothesis, this informational disparity is a fundamental driver of the financing challenges faced by SMEs (Udell, 1998; Gregory et al, 2005).

In the domain of the SME lending, this theory propagates that, SME owners have more and quality information regarding the potential of their firms or the project they seek to finance with the borrowed funds than their prospective financiers. For this reason, information asymmetry becomes a major problem in the SME lending market as there is always some level of disparity in the quality and quantity of information held by borrowers and lenders. Thus, the high cost of resolving the information asymmetry increases the funding constraints for SMEs through unfriendly and unfavourable loan terms (Riding et al, 2010). This imbalance in the information held is synonymous with ,uncertainty or imperfect information and thus any decision made within the contours of uncertainty is bound to fail hence justifying the position of traditional banks for avoiding to lend to SMEs (Hodgson and Drummond, 2009; Imarhiagbe, 2016). However, financial institutions have overtime devised modalities to circumvent this challenge through accounting-based lending, credit scoring, relationship lending and collateral-based lending (Berger and Udell, 2006; Cassar et al, 2015). Yang et al (2019) argued that there are two principal ways of handling information asymmetry. Firstly, by providing incentives for the complete disclosure of private information and secondly, by requiring through law information intermediaries to publicise some critical credit information.

Information asymmetry tends to be more acute in privately held businesses such as SMEs which are not required to disclose publicly some information that is of relevance to banks in their credit decision making (Butler et al, 2007). If this information were to be readily and cheaply available to the public, especially the SME financiers, it would have eased the SME financing constraints by a great deal. Indeed, studies have shown that a reduction in information asymmetry has been found to correlate positively with SME access to financing and translates into better loan terms and maturity (Moro et al, 2015). With adequate information, financiers like banks can accurately determine their risk exposure and henceforth be less hesitant to lend to SMEs (Opondo, 2012).

In evaluating the potential role of credit bureaus in easing the financing challenge of SMEs, Martinez Peria et al (2014) concluded that information from credit bureaus have impact on SME access to finance. Also, Caneghem and Campenhout (2012) concluded that the quality of

information obtained from financial statements is positively correlated with SME's ability to access credit. It is plausible to conclude that, information asymmetry is the root cause of SME financing difficulties from which all other challenges stem from, as such, addressing it will mean greater access if not complete access to financing for viable and growth-oriented SMEs around the world.

### **2.3.2 Transaction Costs**

Transaction cost is one of the major problems of delivering credit to SMEs as certain costs such as legal, computer system, staff remuneration etc are independent of the loan amount (Ayyagari et al, 2017). Transaction cost consists of all costs related to, negotiation, adjusting, enforcing, coordinating, monitoring, and terminating exchange contracts (Carr and Pearson, 1999). Transaction costs of lending to SMEs skyrocket by the information asymmetry that exist between lenders and borrowers (Waari and Mwangi, 2015). Transaction costs of lending to SMEs may be divided into two main groups notably search cost and monitoring or supervisory cost. As a consequent of the information asymmetry challenge, the search cost of lending to SMEs is incurred by financial institutions prior to advancing credit to them in terms of acquiring the credit-relevant information which are not readily available for SMEs. They base their decision to lend to SMEs by determining their creditworthiness from the information they gather. Again, to prevent the SMEs from opportunistic behaviours, monitoring and supervisory costs are incurred to ensure that SMEs borrowers uphold their loan contractual obligations.

The challenge of transaction costs is not only supply-side driven as discussed above from the financier perspective. For instance, an SME owner who desires for a bank but largely operate informally with no formal transaction recording system and a proper business plan, might have to pay a qualified accountant to prepare his accounts and tax returns which are crucial in the bank creditworthiness assessment. These related costs including, travelling costs, cost of guarantee or registering collateral and the accompanying interest rate on the loan will reduce the overall value of the loan to SME borrower through increased costs (Beck and Demirgüç-Kunt, 2006; World Bank, 2010). Thus, transaction cost may be understood as costs incurred by lender and borrower during the loan process (Sulista and Darwanto, 2016).

Traditional financial institutions such as banks, are for-profit organisations, this means they need to cover their costs of operation and add a margin to be sustainable. Lending to thin-file customers like SMEs requires a lot of pre-lending information gathering and post-lending monitoring activities all of which attract costs to avoid the loan going bad. These costs include,

loan administration, monitoring and even liquidation costs of assets in case of default and these costs are passed on to SMEs through high fees and interest rates (Arraiz et al, 2014; Ramalho et al, 2018). Many of costs involve in bank loan administration are relatively fixed and thus do not correlate with the loan amount, this make difficult for SME loans to benefit from economies of scale as the average unit cost is very high relative to smaller amounts that SMEs seek (Liu et al, 2011). Therefore, higher transaction costs do not only increase the interest rates charged on SME loans, but it limits the access to finance through credit rationing behaviour of financiers who try to safeguard their bottom line (Beck, 2007). The SME sector has for far too long grappled with the issue of the unaffordability of bank loans due to transaction costs. However, the group lending mechanism introduced by the Grameen Bank has revolutionised and significantly reduced the transaction cost by sifting the pre-lending screening and post-lending monitoring to the group members of the borrower and the large community (Yunus, 2003; Armendáriz and Morduch, 2010).

### **2.3.3. Owner and Firm Characteristics**

Several academic studies have explored how the idiosyncratic characteristics of SME owners, their firms, and the industries in which they operate contribute significantly to financial constraints (Irwin and Scott, 2010). A central consideration in this discussion is the difficulty of disentangling the characteristics of SME owners and the owner-managed businesses such as SMEs (Kung'u, 2015). Moreover, socio-cultural, and demographic underpinnings of an individual have a great tendency to influence his or her perception about debt, especially using it to start or grow businesses. Generally, empirical literature has documented that female-owned SMEs are more likely to face acute lack of access to finance than their male counterparts as Marlow and Patton (2005) found that male-owner managers have more assets than female-owned managers and asset availability can determine the approval of credit as a form of securitisation for lenders (Cornett et al, 2010). Individual heritage could not be left out in highlighting the potential contributing factors for the SME funding challenge. Resultantly, the Afro-Caribbean although were found to be the most educated from their research sample, but Smallbone et al (2003) found that they were more neglected and disadvantaged in accessing finance for their startups compared to their other counterparts especially the White. This aligns with the findings of Blanchflower et al, (1998) who reported that Black-owned businesses face more severe financing difficulties and are charged higher interest rates than White-owned firms.

Furthermore, the age, education, and experience of SME owners are also critical determinants of financial access. Many of the SMEs around the World are owner-managed and hence the business decision pattern and personal decision pattern of the owner will not fall far apart. By this token Ajagbe (2012) reported that, educational attainment and skills of the business owner are positively related to SME's access to finance. For their part, Musamali et al, (2013 ) argued that the age of business owner and the ownership structure of the business are major determinants of access to credit for SMEs. Extending the age variable on the SME firms, Kirschemann, (2016) concluded that, younger firms are more likely to be credit rationed than older firms. Similarly, on evaluating the determinants of SME access to finance, Nega and Edris, (2016) concluded that, firm's age, manager's experience, and previous engagement with the financier, significantly influence access to finance for SMEs. In addition, Kira (2013) also reported a negative relationship between firm age and ability to access external financial such as bank loans. The fear of rejection makes many women-owned SMEs not to be motivated to seeking financing from banks (Stefani and Vacca, 2015). Firm ownership structure also has a bearing on the ability of SMEs to tap external funding. Nizaeva and Coskun (2018) reported that foreign owned-SMEs especially those that originated from developed economies are less credit constrained than their domestic counterparts as they have potential access to cheaper long-term financing from their home countries.

SME specific factors such as informality, poor management and financial record keeping and inadequate and inappropriate collateral have also been identified as contributing factors to SME financing constraints (Nega and Edris, 2016). For instance, in their study, Ferrando and Mulier, (2015), studied the impact of firm characteristics on the financial constraints of the firm during financial crisis and concluded that, profitable firms are less likely to be financially constrained. Belén Guercio et al, (2020) established that, the likelihood to apply and obtain a bank loan increase with the size of the firm and the industry in which the SME operates in influences the willingness to seek external funding and effective access to bank loans. On the SME industry front, many global SMEs operate in the service industry and mostly operated by women, hence have little to no appropriate assets to pledge as collateral to secure their loans, and as a result have their applications rejected (Rahman et al, 2017). In contrast, Krešić, (2017) concluded that, SME firms in the manufacturing sector are more credit constraints than their counterparts in the service sector, as trade generally has shorter cash conversion cycle than manufacturing.

## **2.4 SME Financing and Financing Constraints.**

Understanding SME financing is very important, as the procurement of financial resources is one of the vital elements of operating a business (Cummings et al, 2020). SME financing consists of myriads of channels and systems used to provide capital to SMEs for their creation, growth, and development (Yoshino and Taghizadeh-Hesary, 2020). Literature indicates that, finance and various capital structure theories have been used to understand the SME financing decisions and preferences including signalling theory, agency cost theory, pecking order theory, financial growth theory etc. From these many theories, the financial growth theory has received the widest attention and acceptance from several researchers as the preferred capital structure model for SMEs (Gregory et al, 2005).

The financial growth theory posits that, the financing needs and options for SMEs evolve and are quite distinct at each stage of their creation, growth, and development, and thus, a different financing strategy is required at each of these stages of development to ensure optimality (Berger and Udell, 1998). Both theoretical and empirical results indicate that SMEs and start-ups generally rely heavily on insider funds at the beginning because they are mostly credit informationally opaque at this point and find it difficult to access intermediated funds (Wetzel Jr, 1994). This aligns with the findings of researchers like Wu et al, (2008) and Abouzeedan, (2003) who concluded that for most SMEs, startup finances come from the founder's or owner's personal savings, sweat equity, retained earnings and loans from family and friends. It is only after exhausting these sources will the owner explore other external sources such as like bank loans, trade credits, factoring, business angles, and venture capitalist financiers (He and Baker, 2007). Meanwhile, the sources of finance for SMEs increases overtime as they become more experienced and less informationally opaque (Berger and Udell, 2002).

The challenge of SME financing is a global development concern but is especially pronounced in emerging and developing economies. According to the World Bank Enterprise Survey (2017), firm managers across the regions consistently identify access to finance as one of the most severe constraints to business growth. These findings are echoed in the work of De Prijcker et al, (2019) who also emphasise the disproportionate financing difficulties faced by SMEs. Empirical research confirms that SMEs are less likely than large firms to secure formal bank loans. Arraiz et al (2014) argue that this discrepancy arises not only from the perceived higher risk associated with SMEs but also from the substantial administrative and monitoring costs involved in SME lending. These costs, when considered in proportion to the typically

smaller loan amounts requested by SMEs, further diminish the economic incentives for banks to engage with this sector.

Meanwhile, credit risk assessment constitutes the cornerstone of conventional finance, serving as the primary mechanism by which financial institutions evaluate the creditworthiness of prospective borrowers. However, traditional credit risk assessment methodologies have often been biased against small and medium enterprises, primarily due to the lack of adequate and relevant financial information typically associated with this sector. Many SMEs, particularly in their early stages, are unable to provide audited financial statements, have limited or non-existent credit histories, lack sufficient collateral, and operate without a significant or stable market share. These deficiencies impede the ability of lenders to accurately assess the risk of default, thereby making SME lending a less attractive proposition (De la Torre et al., 2008, 2009).

A range of studies including, Gbandi and Amissah (2014), Sacerdoti (2005), Quartey et al (2017) have sought to identify the root causes of SME financing constraints. These studies commonly categorise the determinants into two broad groups namely the supply-side factors, including lender risk perception, credit assessment limitations, and institutional inefficiencies and the demand-side factors, such as SMEs limited financial literacy, informality, and reluctance to engage with formal financial institutions. Addressing these constraints requires a holistic understanding of the barriers on both sides of the financing equation. It also necessitates the development of alternative credit assessment models and financial innovations that are better suited to the unique characteristics and needs of SMEs.

## **2.5 Demand and Supply Side Causes of SME Financing Constraints**

A plethora of theoretical and empirical studies have examined the financing restrictions imposed on the SME sector and their related determinants and mitigations (Saci and Mansour, 2023). There are two main strands of theoretical literature that support the foundation of financing-constraints theory. Firstly, the capital structure theory explores the optimal financing choices for managers who are subject to capital-market imperfections to tailor their choices either through the trade-off theory Kraus and Litzenberger (1973) or the pecking-order theory (Myers, 1984; Myers and Majluf, 1984). Secondly, the financial-intermediation theory Diamond (1984) explores bank and firm relationships and the impact of net worth and collateral in alleviating the severity of financing constraints. Often when discussing the SME financing constraints, there is normally a great tendency to discuss the issue from the supply-side factors.

This is premised on the assumption that the demand for funds by SMEs outweighs the supply from the providers. This view on SME financing constraints is rather less holistic, as there are potential demand-side failures as well that might deter SMEs from accessing formal credit (Mueller et al, 2012; Mac an Bhaird, 2010; Lerner, 2010; Fraser, 2014).

### **2.5.1 Demand-Side Factors**

Few theories such as Pecking Order Theory Myers,(1984) and Myers and Majluf, (1984), and Signalling Theory Leland and Pyle (1977), Mueller et al (2012) and Ahlers et al (2015) have been used in the literature to highlight the demand side failures in SME financing. The Pecking Order Theory postulates that, firms display a hierarchical preference for internal sources of capital such as business profits, retaining earnings, owner's personal savings over external sources. Amongst the external sources, firms prefer short-term debts over long-term debts and generally prefer debts to equity as well as internal equity been preferred over external equity (Bhaird and Lucey, 2010). Thus, according to this theory, firm owners prefer to use internal equity first, followed by short-term debt, long-term debt, and finally, external equity (Coleman and Robb, 2012). Moreover, Myers (1984) and Myers and Majluf (1984) contend that, the pecking order theory is more relevant for SMEs due to their informational opacity which induces the equity cost to become high. Even when SMEs use debt to finance their operations, they will prefer to prematurely pay off the debt when internal sources become available (Briozzo et al, 2016).

Beyond structural and institutional constraints, various micro-level demand-side failures contribute significantly to the financing challenges faced by SMEs. One notable factor is the entrepreneurial desire to maintain control and protect proprietary business knowledge or intellectual property. Many SME owners are reluctant to dilute ownership or risk external interference, particularly from equity investors, which may compromise their autonomy and strategic direction (Mueller et al., 2012; Mac an Bhaird, 2010). In addition to control aversion and the limited growth orientation of many SME founders can also hinder their pursuit of external finance. A significant proportion of SME entrepreneurs operate their ventures with subsistence or lifestyle motivations rather than high-growth ambitions, reducing their appetite for expansion-oriented financing (Lerner, 2010; Fraser, 2014).

Another critical behavioural factor is the 'discouraged borrower syndrome', wherein entrepreneurs refrain from applying for credit due to a perceived high likelihood of rejection. Repeated or systemic denials from financial institutions can lead to self-exclusion, even among

otherwise creditworthy businesses (Fraser, 2014). In such cases, SMEs do not demand finance not because of an absence of need, but due to entrenched pessimism or negative expectations of success. Supporting this view, Hoang and Shin (2020), and Sadiq and Zhang (2021) argue that such demand-side psychological barriers can significantly undermine SME development and hinder their potential contributions to economic growth. Similarly, Colla and Kuhn (2017) emphasise that some entrepreneurs avoid seeking credit altogether due to deeply ingrained pessimism or mistrust towards formal financial institutions regardless of actual eligibility.

Extant literature has consistently highlighted that both firm-level and owner-specific characteristics significantly influence the availability and accessibility of financing for SMEs. These characteristics often act as endogenous barriers, impacting lender's perceptions of creditworthiness and shaping SMEs' financing behaviour. For instance, Ferrando and Mulier (2015) examined the effect of firm characteristics on financial constraints during periods of economic crisis and found that profitable firms were less likely to face credit constraints. Their study also revealed that a firm's age and an over-reliance on short-term debt negatively affect access to finance, as these may signal higher risk to lenders. Similarly, Belén Guercio et al (2020) found that larger SMEs are more likely to apply for and successfully obtain bank loans, while industry-specific dynamics also influence both the willingness and ability of SMEs to seek and secure external funding.

Moreover, the financing behaviour of SMEs is often shaped by the attitudes, motivations, and intentions of their founders, particularly regarding risk tolerance and growth aspirations. Van Auken (2001) argued that SME financing decisions are largely influenced by the founder's personal disposition towards business expansion and their perception of financial risk. Supporting this, studies by Massey et al (2006) and Dalborg et al (2012) concluded that broader macroeconomic conditions, as well as the qualitative drivers motivating entrepreneurs such as ambition, vision, and growth orientation play critical roles in determining financing decisions and the extent of financial constraints faced by SMEs. These findings underscore the fact that SME financing constraints are not solely a result of external market inefficiencies but are also deeply intertwined with internal business dynamics and behavioural factors. Addressing these requires a more nuanced policy and institutional approach that recognises the heterogeneity of SMEs and the psychological and operational factors that drive their financial decisions.

## 2.5.2 Supply-Side Factors

The finance gap hypothesis suggests that information asymmetry is the leading cause factor for the financing constraints of SMEs (Berger and Udell, 1998; Gregory et al, 2005). This means that SME firms have profitable investment opportunities, but insufficient funds prevent them from exploiting those opportunities. Consequently, informational opacity and costs are the most cited factors that justify the SME financing constraints relative to larger firms (Daskalakis et al, 2013). The information asymmetry posits that parties to a transaction or any decision-making activity experience an imbalance in the quantity and quality of information held by either of the parties (Osano and Languitane, 2016). Within the domain of the SME lending market, this theory propagates that, SMEs owners have more and quality information regarding the potentials of their firms or the project they seek to finance with the borrowed funds than their prospective financiers. For this reason, information asymmetry becomes a major problem in the SME lending market as there is always some level of disparity in the information held by borrowers and lenders. Meanwhile, a reduction in information asymmetry has been found to correlate positively with SME access to finance and translates into better loan terms and maturity (Moro et al, 2015). Thus, information asymmetry between SMEs and their prospective financiers is the root cause of SME financing constraints (Huang et al, 2014).

The cost of funds, particularly interest rates on small loans, represents a significant supply-side barrier to SME financing. Lending to thin-file customers, such as SMEs who often lack established credit histories or adequate collateral requires extensive due diligence, including pre-lending information gathering and post-lending monitoring to mitigate default risk. These activities are resource-intensive and incur substantial costs for lenders, which are ultimately transferred to borrowers in the form of higher interest rates and fees. Carr and Pearson (1999) define transaction costs as encompassing all costs associated with negotiating, adjusting, enforcing, coordinating, monitoring, and terminating financial exchange contracts. Similarly, Sulista and Darwanto (2016) conceptualise transaction costs as those incurred by both borrowers and lenders throughout the credit lifecycle.

Empirical studies have shown that the transaction costs of lending to SMEs are significantly inflated by the prevalence of information asymmetry between borrowers and lenders Waari and Mwangi (2015). Specifically, search costs which are borne by financial institutions prior to disbursing loans arise from the need to obtain credit-relevant information that is often missing or unreliable in SMEs' financial records. Furthermore, to guard against opportunistic behaviour by borrowers' post-disbursement, lenders incur monitoring and supervisory costs to ensure that

SMEs adhere to the contractual terms of the loan. These cumulative costs are factored into lending decisions and frequently passed on to SME clients in the form of elevated interest rates or non-price credit terms (Arraiz et al, 2014; Ramalho et al, 2018). Thus, the high transaction costs, compounded by information asymmetry, significantly contribute to the financing constraints faced by SMEs, reducing both the affordability and accessibility of formal credit.

Another critical supply-side constraint to SME financing lies in the overall lending infrastructure of a country which is informed by the broader political economy dynamics including power asymmetries, regulatory and policy environment etc. The macroeconomic environment, particularly the depth, sophistication, and competitiveness of the financial system with a focus on the banking sector as well as the strength of legal and institutional frameworks, play a significant role in determining SME's access to external finance. As noted by Berger and Udell (2006) factors such as legal and regulatory frameworks, tax structures, contract enforcement mechanisms, investor protection laws, property rights regulation, and bankruptcy regimes all directly affect the ability of SMEs to secure formal financing. In environments where such infrastructure is underdeveloped or inefficient such as in The Gambia, the risk of SMEs being denied credit increases, and their access to affordable and reliable financing becomes severely constrained (Ehsanullah et al, 2021; Vu Thi KA et al, 2018).

A weak legal environment leads to contract enforcement challenges and undermines lender confidence, prompting financial institutions to adopt risk-averse behaviours toward SME lending. Additionally, the market power hypothesis suggests that low levels of banking competition exacerbate financial constraints for SMEs. In such contexts, SMEs often face credit rationing, higher interest rates, or discouragement from applying for loans due to the lack of alternatives (Nguyen Van Song et al, 2022). Conversely, greater competition among banks has been shown to reduce SME's reliance on informal financing sources and enhance their access to formal credit (Huang et al, 2021c; Nguyen et al, 2022). Thus, a well-functioning lending infrastructure characterised by strong institutions, legal certainty, and financial sector competitiveness is essential to improve the financing environment for SMEs, particularly in emerging and developing economies.

In summary, the literature on the causes of SME financing constraints highlights two broad categories including supply-side and demand-side failures. The supply-side perspective primarily attributes financing constraints to the behaviour of financial institutions, with information asymmetry identified as a key underlying factor that limits lender's willingness to extend credit to SMEs. Other notable supply-side barriers include high transaction costs,

stringent collateral requirements, inefficient legal and regulatory frameworks, and limited competition within the financial sector. Conversely, the demand-side perspective emphasises the role of firm-level and owner-specific characteristics such as managerial experience, attitudes toward growth, risk aversion, fear of rejection, and lack of financial literacy as critical determinants of financing outcomes. These intrinsic factors often influence SME's decisions either to apply for or to avoid external financing altogether. Given the multifaceted nature of the problem, addressing SME financing constraints requires a holistic and integrative approach that considers both supply-side mechanisms and demand-side behavioural and structural barriers. Only by tackling constraints from both angles can policymakers and financial institutions effectively enhance access to finance for SMEs and support their growth and development.

## **2.6 SME Financing Models**

### **2.6.1 Traditional Banking Model**

Traditional banks remain the dominant source of external financing for SMEs. A substantial body of research consistently concludes that banks are the primary external financiers for SMEs (Wu et al, 2008; Ono and Uesugi, 2009; Zhou, 2009; Vera and Onji, 2010). Consequently, much of the existing literature on SME financing constraints canters on the inefficiencies of the traditional banking model in adequately addressing the credit needs of SMEs. The theoretical discourse surrounding the SME-bank relationship largely draws upon two prominent hypotheses namely the market power hypothesis and the information hypothesis. The market power hypothesis posits that, as banks consolidate and increase their market power, SMEs face fewer financing alternatives and often pay higher interest rates due to their dependence on a limited number of lenders (Petersen and Rajan, 1995; Cetorelli, 2001; Beck et al, 2004).

In contrast, the information hypothesis suggests that banks may initially forgo potential profits when lending to informationally opaque firms like SMEs, to develop long-term lending relationships from which they can later extract informational rents (Ryan et al, 2014). According to Moro and Fink (2013), banks approach to lending may be categorised into, financial statement lending (balance sheet-based evaluation), asset-based lending (collateral-based evaluation), credit scoring (evaluating credit relevant information) and relationship-based lending (evaluation of soft information). The prevailing view in SME lending research is that larger banks tend to rely on transactional lending technologies, utilising hard information to lend primarily to more transparent and often larger firms. In contrast, smaller community

and local banks are more adept at extending credit to SMEs using relationship lending technologies that rely on soft information (de la Torre et al, 2010; Kano et al, 2011). Thus, these smaller banks are often better positioned to serve the financing needs of SMEs, particularly those lacking formal documentation or collateral.

### **2.6.2 Non-Bank Financial Institutions Model**

The non-bank financial institutions include microfinance institutions, village savings and credit associations (VISACAs), finance companies, credit unions etc that provide financial services to those who are primarily left out by the mainstream financial institutions. Noteworthy among the non-bank financial institutions active in the SME lending market are the microfinance institutions. Microfinance has been defined by Armendáriz and Morduch (2010) and Ledgerwood et al, (2013) as the provision of financial services to economically active poor people, SMEs and micro entrepreneurs who lack access to traditional financial services. The literature has documented four main models of microfinance operations including the popular Grameen Model, the village banking model, credit union or cooperative model and finally the self-help model (Obaidullah, 2008).

Traditionally, microfinance has primarily targeted the poorest in the developing countries, but its scope has now been extended to cover self-employed individuals, SMEs, microentrepreneurs and family businesses that find it difficult to get formal bank loans (Torre and Vento, 2006). The microfinance delivery framework encompasses both formal and informal channels. The formal channel includes microfinance banks and regulated MFIs, while the informal channel consists of cooperatives, credit unions, and rotational savings and credit associations (ROSCAs) (Taiwo et al, 2016). These institutions help bridge the financing gap for the underserved SMEs by offering flexible, accessible, and context-sensitive financial solutions. A large body of literature documents the impact of microfinance on SMEs development and sustainability (Bello, 2013; Abdulsalam and Tukur, 2014; Kamau and Kalio, 2014; Afolabi and Oni, 2015; Awuah and Addaney, 2016). From their study on microfinance credit accessibility and SME performance in Machakos county in Kenya, Mungutia and Wamugo (2020) concluded that, credit from microfinance institutions is key for the growth of SMEs and their development is hampered by a lack of access to microfinance credit.

### **2.6.3 NGO Model**

SMEs face persistent financial constraints that not only hinder their potentials but also pose a significant threat to a sustainable and inclusive economic growth and global stability.

Consequently, SME financing occupies a central place on the global development agenda. Recognising the pivotal role of SMEs in driving economic development, innovation, and job creation especially in developing economies governments and development-focused non-governmental organisations have established various dedicated institutions and schemes to enhance access to finance for SMEs. Under this model, dedicated institutions such as social development funds in some countries, and NGOs such as USAID, UNICEF, UNIDO, CRS, etc. take on the tasks of providing financing to SMEs and startups. Governments in developing countries in delivering services and addressing some of the social issues such as unemployment and other policy objectives, resorted to creating development agencies and schemes like social development funds, SME loan guarantees etc, to provide among other things financing to SMEs and startups. Notable examples of government assisted SME funding schemes include the small business financing program in Canada and the small firms loan guarantee scheme in the UK (Abdulsaleh and Worthington, 2013). In most cases, funds are received from donors and government subventions Mensah (2004) and are channelled through banks and non-bank financial institutions like microfinance institutions for onward lending to economically active poor households, SMEs, and startups.

In the developing and emerging economies, the NGO-led financing models have gained prominence, particularly due to their flexibility and inclusive approach. As Nasr (2002) observed, the NGO financing models are more accessible for SMEs since they typically do not require complex documentation, audited financial statements, or collateral, which are often demanded by conventional financial institutions. Moreover, two major barriers to SME financing, information asymmetry and moral hazard, are mitigated in the NGO model through frequent on-site visits and relationship-based lending strategies by NGO staff (Armendáriz and Morduch, 2010). In some countries, the NGO model is of two types, specific SME financing vessels which are created primarily for financing SMEs and the improvised microcredit segment in which case, the development NGOs that are already providing specific social and development programs, incorporate micro-lending as an additional service that they provide to the poor households and microenterprises. These models, particularly the latter, have been instrumental in broadening financial inclusion and reaching underserved entrepreneurs, especially in rural and low-income communities where formal financial services remain limited (Helms, 2006).

## **2.6.4 Crowdfunding and Digital Financing Model**

The alternative finance market is understood as the raising of funding outside of the traditional channels like banks and capital markets, and it is revolutionising the financing landscape especially for firms such as SMEs. Crowdfunding is a novel mechanism of fundraising and financing in which small financing contributions are collected from many people often called the backers via a dedicated platform to finance those in need of the funds (project initiators) without involving a traditional intermediary such as a bank (Mollick, 2014). Crowdfunding emerged in the developed countries but soon spread across in the emerging and developing countries (Ibrahim, 2018). The advancements in technology and the internet as well as the growing interest in the concept of decentralised finance, have presented this alternative convenient model of financing SMEs. Digital data availability has primarily been the magic behind the exploration of alternative financing models such as crowdfunding. There is already a myriad of digital, and technology aided funding mechanisms currently being exploited for SME financing including crowdfunding, P2P lending, initial coin offering, digital banking etc. The Cambridge Centre for Alternative Finance has documented 14 different models of digitally aided online alternative financing techniques (CCAF, 2020).

Current researches have shown that SMEs and startups are turning to digitally aided platforms prominently crowdfunding, to finance their business ideas, ventures and projects Troise et al (2020) and various products such as equity-based crowdfunding Feola et al (2021), debt-based crowdfunding Gan et al (2021), donation-based crowdfunding Lazzaro Noonan (2021) and reward-based crowdfunding Jiménez et al (2021) have been exploited to meet the needs and goals of the project initiators (fund users). The overriding goal of crowdfunding is to democratise the supply of financial instruments and reduce the costs related to barriers and geographic constraints. Bechter et al (2011) contends that, crowdfunding allows project initiators such as SMEs to reach out to investors beyond the local communities and raised their required funds with relative ease. Digitalisation also allows traditional banks to economically lend to SMEs by automating certain stages of credit assessment and monitoring and increase their coverage of the previously excluded SMEs (Mills and Mc Carthy, 2017; Thakor, 2019).

The crucial role of global SMEs and their continued funding constraints is pushing all concern parties to look for innovative and value-driven solutions. The increasing digitised nature of global economic and commercial activities as well as the social life of people, couple with the proliferation of internet and the advanced computing powers and analytics are opening novel avenues to address the SME funding challenge. There are many tried and tested solutions and

with better regulations, technology could go a long way in easing the SME financing challenges. As the digital economy continues to evolve, so too do the opportunities to close the SME finance gap, offering a path toward a more equitable, inclusive, and sustainable economic development.

## **2.7 Sources of SME Finance**

### **2.7.1 Internal Sources**

Owner's equity is one of the main internal sources of finance for SMEs. Equity capital is sourced from either the business owner or other early-stage investors (Rubunda et al, 2019). Equity finance is that source of finance that grants its investor a share of ownership of the venture or business he or she invests in. Unlike debt, equity capital has no specific repayment date and amount, and it is suitable for growth-driven firms that have a high risk and return profile and seek long-term investments (Abbasi et al, 2017). The finance theory argues that leverage is appropriate for profitable firms with higher return on investment than the related costs of funds, hence owner's equity is paramount for take-off capital and preoperational expenses (Akingunola, 2011). Internal equity as a source of finance for firms mainly comes from the business founder's personal savings and loans, contributions of the startup team members, sweat equity etc., this insider source of finance is normally considered as a necessary condition for any external injection of capital or financing in order to reduce adverse selection and moral hazard (Berger and Udell, 1998).

Extant empirical studies indicate that, SME owners mainly use their personal savings to provide the seed capital needed to start a business Owusu et al (2020), while Baker et al (2017) concluded that investing personal savings increase the financial capital (equity) that keeps the firm operational. Moreover, SMEs in Greece for instance, were found to be heavily depended on private funds and did not use external sources beyond family borrowings Daskalakis et al (2013). However, some SME owners might choose to source external equity to share the risks with the less risk-averse investors Abdulsaleh and Worthington (2013) as the case is with the use of Islamic participatory modes.

Current business profits and retained earnings constitute a vital source of internal financing for SMEs. These funds emerge because of the firm's dividend policy, which determines the proportion of net profits to be retained within the business or distributed as dividends to shareholders. In situations where access to formal external financing is limited or costly, SMEs are often compelled to rely heavily on internally generated funds, particularly retained

earnings, to support operations, reinvestment, and growth (Rubunda et al, 2019). Retained earnings have been empirically found to be strategic source of entrepreneurial financial capital Owusu et al (2020) rationalising the notion that, the continuity of a firm in business is hinged on making more profits Holtz-Eakin et al (1994). They enable reinvestment without incurring additional financial obligations or dilution of ownership. Baker et al (2020) found that 92 per cent of their respondents preferred to use retained earnings, followed by owner funds at 88 per cent as a source to finance their operations. It is argued that firms with healthy profits have lesser need for debt than weak profit or loss-making firms (Mikocziova, 2010). The profit of the firm has found to be a good predictor of the financial availability and strength of a firm Adomako and Danso (2014) while Habib and Yazdanfar (2016) concluded that, profitability is positively related with financial capital availability of a firm. SME entrepreneurs rarely pursue debt or equity sources without exhausting the internal sources including retain earning Owusu et al (2020) this goes to show that the pecking order and trade-off theories somehow if not completely explain the financial behaviour of SMEs (Wellalage and Fernandez, 2019).

### **2.7.2 External Sources**

Borrowing from family and friends' remains a prominent and accessible external source of finance for startups mainly, and more so SMEs. Generally, financing from family and friends is a common source of finance for the poor Collins et al (2010) and it is and remains to be a vibrant alternative source of capital for SMEs (Okroku and Croffie, 1997). In line with the pecking order theory and the desire of SMEs owners to keep control of their businesses, taking loans from family and friends as trust capital is more appealing to many control freak SME entrepreneurs as it is less invasive. Family and friends collectively provide a quasi-equity and provide a good predictor and have a great influence on the financial capital availability to a firm (Baker et al, 2017; Owusu et al, 2020). Concluding from their study on SMEs in South Africa, Masutha and Rogerson (2014) indicated that over 67 per cent of the SME owners financed their startup capital from private or family savings.

Evaluating the barriers faced by the UK SMEs in raising bank finance, Irwin and Scott (2010) concluded that SME owners who are educated up to A levels, quite often use family and friends and mortgaged their houses to finance their ventures. It could be understood from the above cited literature that small business owners turn to their family and friends especially at the startup stage of their businesses for love or trust capital after having exhausted their personal savings. At this point, small businesses have little or no assets to guarantee their loans and therefore cannot go to formal financial institutions like banks to seek financial assistance. The

seemingly apparent resort for them becomes their family and friends to bridge their capital shortfall. Although there is relative ease in terms of documents and requirements in sourcing shortfall capital from family and friends as an informal external source for SMEs, one of its drawbacks is that it is not always available and it is mostly in smaller amounts.

Commercial banks are a major source of external finance for SMEs (Irwin and Scott, 2010; Ghandi and Amisah, 2014; Agwu and Murray, 2014). However, commercial banks tend to hold SMEs to the same standard of credit scoring as with larger firms in their credit decision, which disproportionately disadvantages SMEs due to their limited credit relevant information, hence commercial banks are reported to have largely avoided the SME sector due to their perceived riskiness and inadequate credit relevant information. The finance gap hypothesis suggests that information asymmetry is the leading cause for the financing constraints of SMEs (Udell, 1998; Gregory et al, 2005). The rule of thumb for lending to SMEs by banks is in their ability to evaluate the creditworthiness of SME firms. For instance, Bashir et al (2010) noted in their study that SMEs in Pakistan are being neglected by banks and other financial institutions. Luper (2012) reported that in Nigeria, the commercial bank loan to SMEs declined from 48.79 per cent in 1992 to 0.15 per cent in 2010. These declines show that commercial banks have less preference to lend to SMEs (Oke and Aluko, 2015).

In fact, many of the SME financing constraints studies revolve around the inefficacy of the banking model of SME financing in extending the required credit to SMEs. Bank lending to SMEs has seen a permanent decline after the global financial crisis of 2007/08, but even before the global financial crisis, more than 60 per cent of the SME loans came from non-bank institutions (Gopal and Schnabl, 2022). Hence, the debate on the significant contribution of banks in extending the required financing to SMEs is largely inconclusive as there are studies extolling the banks as the main source of external financing for SMEs Wu et al (2008) and Ono and Uesugi (2009) and Zhou (2009) and Vera and Onji (2010) and those that blame banks for shunning the SMEs and consider them a risky investment due to the challenges of information asymmetry and the resulting adverse selection and moral hazard Quaye and Sarbah (2014) and as a result, SMEs mainly rely on informal sources of finance (Khan, 2010).

NBFIs are a cluster of regulated and unregulated organisations that are different than banks from a regulatory standpoint. They include microfinance institutions, credit unions, pension funds, mutual funds, cooperatives etc. Generally, NBFIs are considered as an important source of finance for the unserved and underserved segments such as SMEs (Khowaja et al, 2021).

Datta (2014), underscored that NBFIs serve as important financial intermediaries in both developing and developed countries.

As lower-level operators of providing financial services, the Non-Bank Financial Institutions (NBFIs) chiefly the microfinance institutions also represent significant source of external finance for SMEs. The abstention by commercial banks from mainly lending to SMEs, necessitates the role of complementary institutions such as NBFIs, whose risk appetite and investment horizon are different from commercial banks. In this regard, Lemuel (2009) opined that, a well-diversified financial system comprising of banks and NBFIs is considered critical in providing the required financial resources to the economic units in need such as SMEs.

Moreover, NBFIs support established firms to continue operations, finance startups and provide bailout for smaller firms when they suffer from external shocks (Khowaja et al, 2021). A large body of literature documents the impact of microfinance on SMEs development and sustainability (Bello, 2013; Abdulsalam and Tukur, 2014; Kamau and Kalio, 2014; Afolabi and Oni, 2015; Awuah and Addaney, 2016). Olowe et al (2013) established that, the services provided by microfinance banks as well as the loan duration, both have significant positive impact on the growth of SMEs in Nigeria. Again, in the US, a study by Goff and Nasiripour (2012) concluded that over half of credit of SMEs comes from the NBFIs. Furthermore, the provision of finance to SMEs by microfinance institutions does not only enhance their financial muscles and performance Simeyo et al (2011) but also supports the income level of households in the society (Zimba, 2016).

Business angles are another category of external financiers for SMEs and early growth firms seeking risk capital (Mason and Harrison, 2015). Business angles are an early-stage seed or growth capital investors who invest in risky but promising firms or projects (Lupenko and Freshchenko, 2015). There is a growing consensus that business angels are one of the main sources of finance for new and early growth firms seeking risk capital (Mason and Harrison, 2015). They usually invest in SMEs directly using equity contracts (Abdulsaleh and Worthington, 2013). The business angle's capital bridges the gap between SME founder's personal funding and the other external sources of finance (Moses and Adebisi, 2013). Angel investment in SMEs could either be one-off lump sum or intermittent financial support for the SME firm as and when needed mainly during difficult times (Moses and Adebisi, 2013). Empirical studies indicated that, angle investors dominate venture capital financing both in terms of value and the number of SMEs firm coverage (Fairchild, 2011; OECD, 2011). Morrisette (2007) estimated the value of angel's investment in SMEs to be seven times more

than venture capital. According to Shane (2012) angel investors inject between \$12.7 and \$36 billion each year into SMEs. In the EU countries, over 68 per cent of investments in SMEs comes from business angel investors (EBAN, 2016). Similarly, The European Business Angel Network (EBAN) (2014) estimates that in Europe, business angels invest €3 for every €1 invested by venture capital funds in the early-stage investment market (Mason et al, 2017). In 2015, the angel investors were estimated to have invested over \$25 billion in young ventures (Sohl, 2015).

Venture capitalists are another category of risk capital providers that are normally next to the angel investors in the line of successions for equity investment as an external source of finance for SMEs. A venture capital is a professionally managed pool of risk capital raised with the sole motive of direct equity investment in a fast-growing private business (Biney, 2018). Venture capitalists raised their investable funds from institutional investors and high-net-worth individuals across the economic spectrum. As one of the early-stage financing for SMEs, the overriding goal of a venture capital is to provide the needed risk capital that will allow smaller firms to grow into big firms. Hence, venture capital is a form of equity investment mainly in existing businesses with growth potential (Mamba, 2011).

Venture capital investments are usually medium to long-term in nature and are done in exchange for an equity stake in a privately held business (Rossi, 2015). Venture capital is seen by researchers and practitioners as viable sources of risk capital critical for the survival and success of SMEs in the emerging economic (Kato, 2021). As one of the primary sources of private equity capital, Mamba (2014) opined that the proliferation of venture capital firms in the developed countries has been critical in providing equity to SMEs. Studies such as Mamba (2011), Croce et al (2013) and Capizzi et al (2011) concluded that venture capital financing enhances the growth of smaller firms they invest in and, it is easier for firms that benefited from venture funds to secure bank loans. Baraka and Abel (2015) concluded that SMEs that received venture capital funds registered significant growth in sales, profitability, asset growth and attracted other sources of funding and employment opportunities (Kato, 2021). Wu and Xu (2020) reported that, venture-backed SMEs have improved access to lower cost bank loans and are less likely to default on their loans. Hence, Venture capital is seen by researchers and practitioners as a viable source of risk capital critical for the survival and success of SMEs in the emerging economy (Kato, 2021).

Trade credit is one of the alternative ways of financing business needs Abbasi et al (2017) and provides almost one third of the SME debt in the US (McGuinness et al, 2018). It is the second

most important source of external financing for SMEs after bank loans in both developed and developing countries (Carbó-Valverde et al, 2016). Trade credit is a financing mechanism of delaying or postponing the payment of the goods or services received or enjoyed as a benefit to the recipient. The relevance of trade credit as a source of finance for SMEs is more pronounced in countries with underdeveloped banking and financial systems. Confronted by market imperfections such as information asymmetry, SMEs turn to trade credit to overcome problems related to credit rationing (Gama et al, 2010). Fatoki and Odeyemi (2010) argue that trade credit is the most preferred mode of finance for young SMEs especially in their formative years when risks are very high and such financing mechanisms hardly require the traditional collateral for credit (Yazdanfar, 2012).

Studies such as Huang et al (2011) and Ghosh (2015) have all postulated that, trade credit is a prelude for bank lending to SMEs as it serves to signal the creditworthiness of their recipients to the prospective lenders. McGuinness et al (2018) reported that trade credit has a large and positive impact on the SME survival especially during the recent global financial crisis. Generally, privately held firms such as SMEs are more reliant on trade credit than public firms mainly due to their listing status (Abdulla et al, 2017). From their study on 13 European countries McGuinness et al (2018) reported that, account payable and account receivable represented 16 and 30 per cent of total assets or 110 billion or 172 billion euros respectively. Rahman Cepel (2018) concluded that trade credit is majorly used by firms in manufacturing sector relative to service-oriented firms.

The alternative finance market is understood as the raising of funding outside of the traditional channels like banks and capital markets, and it is revolutionising the financing landscape especially for those firms such as SMEs that are shunned by the traditional incumbents. Crowdfunding is a new but increasingly popular source of finance for SMEs. It evolved after the 2008 global financial crisis Bruton et al (2015) and the concept is anchored on the broader understanding of crowdsourcing which entails gathering ideas, feedback from many different people ‘‘the crowd’’ (Cox and Nguhen, 2018). This allows the proponents of the venture or the project (SMEs) to have a direct link with the potential investors which reduces the search and transaction costs, and appeal to the investors (Jiménez et al, 2021; Goethner et al, 2021).

The advancements in technology and the huge internet coverage, including the globalisation of social media as well as the growing interest in the concept of decentralised finance, have together presented crowdfunding as a convenient model for financing SMEs (Boylan et al, 2018). Husin and Haron (2020) defined crowdfunding as a new technology-enabled process of

raising money to fund an idea, product, or whole business venture. Thus, crowdfunding leverages the internet platform and connect fund seekers (SMEs) and fund providers (investors) by sidestepping the traditional intermediaries like banks and capital markets (Mollick, 2014; IFSB, 2017). Crowdfunding thus play a vital role in entrepreneurial finance ecosystem Achsien and Purnamasari (2016) especially for SMEs that constantly have limited access to traditional bank loans (Husin and Haron, 2020).

Literature has differentiated between four main crowdfunding models that have so far been used to raise funds for the varying needs of start-ups and SMEs such as equity-based crowdfunding Feola et al (2021), debt-based crowdfunding Gan et al (2021), donation-based crowdfunding Lazzaro Noonan (2021) and reward-based crowdfunding Jiménez et al (2021). Crowdfunding has been found by many researchers to be an excellent alternative source of finance for startups and SMEs Paschen (2017) and facilitates the transformation of novel and innovative business ideas into feasible and sustainable businesses (Stemler, 2013). Bruton et al (2015) reported that crowdfunding profoundly contributes to the growth of small businesses by filling the funding gap they are confronted with because of the market imperfections. Crowdfunding enables SMEs to acquire the necessary funds for their development without giving up the control of their firms which resonates well with most SME founders who are averse to intrusion into firm management and control (Cox and Nguhen, 2018).

The foregoing discussions are very central to lay the foundation and shape the overall direction of the study. For instance, by engaging with key theories such as information asymmetry (Akerlof, 1970), credit rationing (Stiglitz and Weiss, 1981), the pecking order theory (Myers and Majluf, 1984), and behavioural finance perspectives (Kahneman and Tversky, 1979), the literature review provides the conceptual lenses through which SME financing challenges are understood. Furthermore, by critically synthesising these works, the review justifies the need for further investigation, particularly in emerging areas such as the Islamic participatory financing and the use of psychometric and data-driven approaches. Moreover, having identified the gaps and the inconsistencies in the empirical findings, the foregoing comprehensive review helps to refine the focus of the study by linking existing findings to specific variables such as entrepreneur characteristics, firm attributes, and institutional factors (Storey, 1994; Fatoki, 2014). This ensures that the research questions are logically derived and empirically testable. More importantly, the review supports the development of a conceptual framework and a benchmark for interpreting the research findings. In essence, this segment of the literature review acts as an intellectual bridge between existing scholarship on SME financing constraints

and the need for the current study, by shaping the agenda, strengthens methodological coherence, and enhances the credibility and academic contribution of the study.

## **2.8 Conclusion**

This chapter has critically reviewed the existing literature on the multifaceted challenges facing SMEs in accessing external finance, with a particular focus on the role of information asymmetry, transaction costs, and owner and firm-level characteristics. The review confirms that SMEs despite their recognised contribution to employment creation, innovation, poverty alleviation, and economic diversification, they remain disproportionately credit-constrained compared to larger firms. A recurring theme across the literature is that information asymmetry constitutes the foundational barrier to SME financing, giving rise to problems such as adverse selection and moral hazard, which in turn drive up transaction costs and increase lender risk aversion. In summary, the literature underscores the complexity and interdependence of the factors contributing to SME financing constraints. This calls for a rethinking of SME financing strategies, combining innovative technologies with contextually appropriate financial models such as Islamic finance.

## **CHAPTER 3**

# **ISLAM, ENTREPRENEURSHIP, CHALLENGES OF ISLAMIC PARTICIPATORY FINANCING AND THE PROPOSED SOLUTION**

### **3.1 Theoretical Framework**

This research adopts a multi-theory approach to examine the value of psychometrics and data mining in promoting the use of the Islamic participatory modes of financing. These theories helped contextualise the informational, behavioural, and structural constraints that impede the effective deployment of the Islamic participatory or partnership instruments. Unlike conventional loan contracts that carry a fixed return on financing, the Islamic participatory modes of financing are equity and equity-like financing instruments that do not carry a fixed return on financing. In the modern banking application of the Islamic participatory modes, the capital provider has little or no involvement in the management of the investment project or business, and he is also only entitled to investment returns when the project or business is profitable and is reported as such by the partner entrepreneur (SME operator). Such financing arrangements creates a huge vulnerability for the capital provider, whereby the Islamic finance institutions (IFI) is not only less involved in the management of the investment but also relies on the trustworthiness of the SME entrepreneur for appropriate investment returns. Thus, using such financing modes by the IFIs, would require a holistic evaluation of the nature of the financing arrangement, the character of the business entrepreneur and the value proposition of the financing institutions. Hence, it is against this backdrop that this research employed a multi-theory approach which comprises three distinct but complementary theories including information asymmetry theory, Islamic entrepreneurship theory and the institutional logic theory. The triangulation of these distinctive theories underpins the theoretical foundation of this study. This new theoretical framework would explore the intricate links of these three theories as they have bearing on the use of Islamic participatory modes of financing. Each of these theories and their implications for participatory finance is discussed below.

#### **3.1.1 Information Asymmetry Theory**

As indicated earlier, information asymmetry is defined as a situation in which one party to an economic transaction has better and perhaps more information than the other (Imarhiagbe,

2016). The seminal works of Akerlof (1970), Rothschild and Stiglitz (1976) and Stiglitz and Weiss (1981) laid the theoretical foundation of the role of information asymmetry in explaining the financial constraints of SMEs in the financial markets. The theory of information asymmetry postulates that parties to a transaction or any decision-making activity experience an imbalance in the quantity and quality of information held by either of the parties (Osano and Languitane, 2016). Furthermore, the finance gap hypothesis suggests that information asymmetry is the leading impeding factor for the financing constraints of SMEs (Berger and Udell, 1998; Gregory et al, 2005).

In the context of using the Islamic participatory modes of financing by IFIs, the information asymmetry stems from the fact that IFIs do not have the capacity to be involved in the businesses of all the SME clients they could finance, hence SME entrepreneurs would have better and more information about the potential and actual performance of the investment than the IFIs. Meanwhile, a reduction in information asymmetry has been found to correlate positively with SME access to financing and translates into better loan terms and maturity (Moro et al, 2015).

### **3.1.2 Islamic Entrepreneurship Theory**

The influence of Islamic law (Shariah) plays a critical role in shaping the nature and conduct of Islamic entrepreneurial activity (Ashraf, 2019). At the core of Islamic entrepreneurship lies Islamic economics, which Khan (1994) defines as an economic system aimed at achieving *Falah* that is, success in both this world and the hereafter by organising earthly resources in a manner grounded in cooperation and mutual participation. Unlike conventional entrepreneurial paradigms that are often profit-maximisation driven, Islamic entrepreneurship is embedded in a moral and ethical framework, where commercial and financial practices are bound by divine prescriptions. The theoretical development of Islamic entrepreneurship is still in its nascent stages, but early scholarly efforts have sought to anchor it within established behavioural and psychological models.

Notably, the works of Ashraf (2017, 2018) are considered pioneering attempts at theorising Islamic entrepreneurship as an extension of Theory of Planned Behaviour (TPB) (Ajzen, 1991; Ajzen, 2000a). Building upon this foundation, (Ashraf, 2019) proposed a reformulation of TPB by replacing its core variables attitude, subjective norms, and perceived behavioural control with empathy, moral obligation, self-efficacy, and perceived social control as antecedents of *Niyyah*, a concept which he regards as central to Islamic entrepreneurial intention. *Niyyah*,

often translated as ‘worshipful intention’, underscores the idea that economic activity, including entrepreneurship, should be conducted with the intention to serve God and benefit society, rather than for mere material gain. This forms the basis of Ashraf’s (2019) Theory of Islamic Entrepreneurship (TIE), which emphasises a spiritual and ethical dimension to entrepreneurial intention and behaviour. In this model, entrepreneurship is viewed not just as a means of individual advancement but also as a form of worship that contributes to societal welfare and aligns with Islamic moral values.

Supporting this view, Gümüşay (2015) asserts that Islamic entrepreneurship should not be perceived merely as a combination of Islam and entrepreneurship, but rather as a multidimensional and integrated phenomenon grounded in three interconnected pillars including entrepreneurial, socio-economic and ethical, and religious-spiritual. These dimensions are interwoven to produce a reward structure that is material, social, and spiritual in nature. An essential characteristic of an Islamic entrepreneur, therefore, is the willingness to share both profits (the upside) and losses (the downside) in line with principles such as risk-sharing and mutual responsibility. Moreover, the entrepreneur is encouraged to forego personal gain for the greater collective benefit, with the goal of attaining *Falah* that is comprehensive success encompassing material prosperity, social contribution, and spiritual fulfilment.

### **3.1.3 Institutional Logic Theory**

Institutional logic has been largely recognised as a popular tool in explaining organisational action (Adam et al, 2016). Institutional logic is defined as a set of shared beliefs that rationalise the value of goals and interest (Thornton et al, 2012). It includes the socially constructed historical patterns of symbols and material practices, including assumptions, values and beliefs, by which individuals and organisations provide meaning to their daily activity, organise time and space and reproduce their lives and experiences. The concept of institutional logic has also been defined as a way of understanding how actor’s behaviour is conditioned by a specific frame of reference that informs sense-making, create a vocabulary of motivation and identities that the actor brings to the situation (Ezzamel et al, 2012). Thus, institutional logic creates expectations of how an organisation should act within a given situation through a variety of ways to promote aligned action (Wry et al, 2013).

Central in the composition of an institutional logic is the understanding of what value is, as value is described as the ‘presumed product of its prescribed practices, the foundation stone of its ontology, the sources of the legitimacy of its rules, a basis of individual identification, a

ground for agency and the foundation up on which its powers are constituted' (Thornton et al, 2012 p.585). The link between logics and the practices of organisations and institutions is well documented in the literature (Lounsbury, 2007; Mahmood and Uddin, 2021). The modern financial and banking systems are situated within the market or financial logic, which is driven by economic rationality and determining calculated exchange values (Friedland and Alford, 1991; Worakantak et al, 2024). This logic is anchored on the supreme authority of shareholder interest, which is characterised by profit-maximisation objectives and the pursuit of individualistic rather than collective well-being.

Meanwhile, the notable founders of Islamic economics such as Qureshi (1974), Mawdudi (1986), Qutb, (1976) and Chapra (1993) proposed a distinct normative and theoretical alternative to the dominant capitalist system (Asutay and Yilmaz, 2025). Thus, the resulting financial system from this proposal should never be solely market-driven, but rather have its objectives aligned with society's moral norms and values, resulting in an embedded alternative (Asutay and Yilmaz, 2025). The religious imperative requires modern Islamic finance institutions to embed religious dogma into their financial instruments (Iqbal and Mirakhor, 2007; Nurul Hidayah et al, 2018). It is therefore reasonable to argue that the institutional logic of modern Islamic financial institutions should be grounded in the achievement of the *maqāṣid al-Sharī'ah* (objectives of Shariah). Building on this premise, the true measure of the effectiveness and value of modern Islamic finance particularly as a viable alternative to conventional finance, lies in its capacity to promote economic growth and alleviate poverty. This can be achieved primarily through financing mechanisms that rely on participatory or risk-sharing modes, which present a genuine alternative to the debt-driven structure that dominates the mainstream financial system (Asutay, 2012; Mirakhor and Iqbal, 2007).

Institutional logics do not operate in isolation at the organisational level, they are rather embedded within macro-level systems of power, governance, and resource distribution (Thornton et al., 2012; Friedland and Alford, 1991). Political economy factors such as government policy, regulatory quality, and institutional capacity play a critical role in determining how financial resources are distributed (North, 1990; Acemoglu and Robinson, 2012). From this perspective, institutional logics help explain how structural barriers to finance are created and sustained. The dominance of a market-oriented logic within financial systems is reflective of a system that prioritises efficiency, risk minimisation and profit maximisation (Friedland and Alford, 1991; Beck and Demirgüç-Kunt, 2006). This often leads to the allocation of financial resources toward larger, well-established firms, while structurally

marginalising segments like SMEs. Such outcomes are not merely the result of individual lending decisions but reflect deeper institutionalised norms that defines things like creditworthiness, value, and acceptable risk (Berger and Udell, 2006). While actors such as SMEs and financial institutions are embedded within dominant logics, their ability to navigate or challenge these logics is constrained by structural conditions, including access to networks, information, and institutional support (Seo and Creed, 2002; Battilana, 2006). Thus, the effectiveness of Islamic finance in achieving its developmental goals therefore depends not only on institutional intent, but also on the broader political economic environment in which it is embedded (Asutay and Yilmaz, 2025).

In summary, the triangulation of these three foundational theories that including the information asymmetry theory, Islamic entrepreneurship theory, and institutional logic theory offers a comprehensive and robust conceptual framework to examine the use of Islamic participatory modes of financing for SMEs by IFIs. This integrated perspective not only reinforces the ethical underpinnings of modern Islamic finance, but also addresses the practical challenges associated with SME financing and highlights the strategic adoption of technology within the confines of the Islamic law. Specifically, Information Asymmetry Theory highlights the imbalance in information between IFIs, acting as investors, and SME entrepreneurs, acting as investment managers. In the Islamic participatory finance, this asymmetry can result in adverse selection and moral hazard. Therefore, resolving this imbalance is critical for the success of equity-based financing like the Islamic participatory modes. The Islamic Entrepreneurship Theory adds a moral and ethical lens to economic activity, placing emphasis on the values of honesty, trustworthiness, and accountability in business dealings. It especially calls on SME entrepreneurs to uphold these principles, particularly in disclosing the actual performance of projects financed through Islamic participatory modes. The concept of *Niyyah* (intention) plays a central role, ensuring that entrepreneurship is not solely profit-driven but aligned with broader Islamic objectives such as *Falah* (success in this world and the hereafter). Institutional Logic Theory situates IFIs within a broader socio-economic and spiritual context. It argues that IFIs, as institutional actors, should operate under a community logic that prioritises social welfare, economic justice, and collective well-being rather than the prevailing market logic of shareholder primacy and profit maximisation. This view challenges IFIs to realign their objectives and operational practices with the moral imperatives of the Islamic Law (Shariah).

The triangulation of these three perspectives culminates in the formulation of a new theoretical construct which is herein proposed as the Islamic Equity Financing Theory (IEFT). This emergent theory serves as the foundational framework for this research, providing a multidimensional lens through which to explore the utilisation of Islamic participatory financing modes. By synthesising these strands, the IEFT provides a normative and practical framework for IFIs to effectively engage in SME financing, while upholding Islamic ethical standards, addressing structural constraints, and leveraging modern technological tools within the boundaries of Shariah compliance.

### **3.2 Islam and Entrepreneurship and the Islamic Entrepreneurship Framework**

The Islamic teachings from (*Quran and Sunnah*) are replete with instances of encouragement of entrepreneurship (Kayed and Hassan, 2010). For example, Allah says in the Holy Quran ‘And when prayer is over, disperse in the world and search for the bounty of Allah’ (*Qur’an*, 62, 10)<sup>1</sup>. In another verse, Allah says “But Allah hath permitted trade (*Bay’*) and forbidden usury (*Riba*)’ (*Qur’an*, 2:275)<sup>2</sup>. The Prophet Muhammad (PBUH) is reported to have said ‘A faithful and trustworthy businessperson will be resurrected on the Day of Judgement with the prophets, the truthful, and the martyrs’ (Ibn Majah and al-Tirmithi)<sup>3</sup>. The Prophet Muhammad (PBUH) was asked what type of earning was best, and he replied ‘; A man’s work with his hands and every (lawful) business transaction’ (Ahmad)<sup>4</sup>. These *Quranic* verses and *Hadith (Sunnah)* of the Prophet clearly emphasise the importance of engaging in entrepreneurial activities for the good of the society (Khaliq et al, 2020). Consequently, it is plausible to argue that entrepreneurship is part and parcel of the Islamic culture (Raza et al, 2023). Islam and entrepreneurship have many common traits Raza et al (2023), and Islam holds entrepreneurship in high regards (Sadeq, 1997). In general, Islam as a way of life has a positive approach towards work and productivity which facilitates the creation of businesses such as SMEs which is important to promote human advancement (Hassan, 2015).

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<sup>1</sup> Quran Chapter 62 verse, 10.

<sup>2</sup> Quran Chapter 2 verse, 275.

<sup>3</sup> [Jami' at-Tirmidhi 1209](#) Vol. 3 Book 12, Hadith 1209, [Sunan Ibn Majah 2139](#) Vol. 3, Book 12, Hadith 2139

<sup>4</sup> Mishkat al-Masabih 2783 Book 11, Hadith 25/ [Reported by al-Bazzar; al-Hakim/ Bulugh Al -Maram Book 7 Hadith 784.

As highlighted earlier, entrepreneurship has been seen as an attempt to create new ventures or products by taking risks and introducing initiatives for the purpose of profit (Burns, 2016). However, religion, spirituality and altruism are important motives behind Islamic entrepreneurship (Hassan, 2015). Entrepreneurship in Islam is seen both as a mean of being thankful to Allah and a way of helping others. Entrepreneurship from an Islamic perspective emphasises a balance between personal and communal interests. While individuals may pursue profit and personal growth, their entrepreneurial activities are guided by ethical principles that prioritise the well-being of the wider community. Moreover, business actions are framed within a spiritual context, where ethical conduct and social responsibility are linked to accountability in the afterlife, thereby integrating both worldly and spiritual objectives (Gümüşay, 2015). Baqutayan (2016) contends that a Muslim entrepreneur or any entrepreneur operating within the contours of the Islamic law (Shariah), is not solely focused on maximising profit for oneself, but invest or let go part of their profit from their assets for the afterlife.

Islam regulates the behaviour of a Muslim entrepreneur by providing a unique set of codes of conduct Islam and Ahmad (2022) and these codes of conducts are positive attributes that could lead to the generation of higher profits for businesses (Gursoy et al, 2017). As an entrepreneur, the Prophet (PBUH) has earned and taught the qualities and virtues like integrity, wisdom, trust, and trustworthiness, kindness etc (Khalique et al, 2020). Several academic studies have supported the position that Islamic values and principles encourage entrepreneurship (Davis, 2013; Ramadani et al, 2015; Kayed and Hassan, 2010). According to World Bank Group and Islamic Development Bank (2015) Islamic finance generally supports entrepreneurship through the promotion of asset-based financing and risk-sharing financing which resultantly reduces the heavy financialization in the economy and promote growth. Researchers such as Kumar et al (2022) contend that religion can influence decision of an individual to become an entrepreneur and the entrepreneurial activities. Moreover, Islamic entrepreneurship plays a vital role in creation, survival, and success of SMEs (Khan et al, 2021).

Islamic entrepreneurship is embedded in Islamic economics, which has been defined by Khan (1994) as an economic system that aims to achieve human *Falah* (i.e., success in this world and hereafter), by organising the resources of the Earth based on cooperation and participation. The theory of Islamic entrepreneurship is still evolving, and it is primarily anchored on the Islamic ethical and moral values in financial, commercial and economic dealings. The pioneering works of Ashraf (2017, 2018) as highlighted earlier, have been credited with the initial attempts of theorising Islamic entrepreneurship as an offshoot of the popular Theory of

Planned Behaviour postulated by (Ajzen, 1991; Ajzen, 2000a). Arguing alongside the irrationality assumption of economic agents as propagated by behavioural economists, (Ashraf, 2018), modified the generalised rationality assumption in (Ajzen, 1991; Ajzen, 2000a)'s TPB, with boundedly rationality, while maintaining the other antecedents to produce a new theory dubbed (TBRPB) 'Theory of Boundedly Rational Planned Behaviour'.

The crux of this new theory argues that human rationality is bounded by the known alternatives for any course of action (Ashraf, 2019). In this new theory, Ashraf (2019), replaced the generalized rationality in (Ajzen, 1991; Ajzen, 2000a)'s TPB and boundedly rational intention in (Ashraf, 2018)'s TBRPB with '*NIYYAH*'. Niyyah for lack of a better word, may be translated as worshipful intention. In the Islamic literature, Niyyah is seen as the nucleus of human activities which determines whether actions are done primarily for the sake of the Almighty God hence expect reward from Him or merely for a deliberate mundane motive. This inert meaning of *Niyyah* in Islam, is the gist of the theory of Islamic entrepreneurship.

According to Ashraf (2019), there are four categories of conditions of wellbeing, and they include: Spiritual (individual), Economic (individual and societal), Cultural (individual and social practices) and Political (justice and security for all). Based on this categorisation of conditions of wellbeing, empathy, moral obligation or societal normative values, and internal and external controls are seen and found to be Islamic values that would influence the Islamic entrepreneurship intentions and actions (Hockerts, 2017; Forster and Grichnik, 2013; Schlaegel and Koenig, 2014; Smith, 2012; Mair and Noboa, 2006). To this end, Gümüşay (2015), argues that Islamic entrepreneurship is not just a mere summation of Islam and entrepreneurship but rather a complex phenomenon anchored on three interwoven pillars, such as entrepreneurial, socio-economic, and ethical as well as religion-spiritual pillars. Hence, the reward structure for an Islamic entrepreneurial enterprise built on Islamic entrepreneurial theory will be material, social, and spiritual.

### **3.3 Islamic Finance: An Overview**

Modern Islamic finance is a financial system that operates in line with the principles and tenets of the Islamic Law (Shariah). It is a rapidly expanding segment of the global financial system and has been propagated as viable alternative to the dominant conventional system. Tracing its modern roots to the creation of Mit Ghamr (1963) and Dubai Islamic Bank (1975) amongst others, the industry continues to demonstrate remarkable vitality and global momentum (ICD-LSEG, 2025). It is currently estimated to have footprints in over 140 countries, operating

through over a network of 2,255 financial institutions, yielding a year-on-year growth of 21 per cent and a total asset value of approximately USD 6 trillion (ICD-LSEG, 2025). Unlike conventional finance, Islamic finance prohibits *riba* (interest), *gharar* (excessive uncertainty), and investments in activities considered harmful or unethical, such as gambling, alcohol, or speculative trading (El-Gamal, 2006). The industry seeks to align financial activities with moral values by promoting fairness, transparency, and the equitable distribution of wealth. Thus, a foundational aspect of Islamic finance is the use of profit-and-loss-sharing partnerships, such as *mudarabah* (entrepreneur-investor arrangements) and *musharakah* (joint ventures), alongside trade-based contracts like *murabaha* (cost-plus sale), leasing contracts (*ijarah*), and Islamic bonds (*sukuk*). These structures ensure that financing is tied to tangible assets and real economic value, rather than speculative or purely financial leverage. The industry is projected to be around USD10 trillion by 2029 (ICD-LSEG, 2025).

### 3.3.1 Islamic Finance Contracts

Islamic contracts or Shariah nominate contracts are the foundational tenets of the modern Islamic finance products. The Islamic finance products are built on the back of a single or multiple Islamic contracts. These contracts form the operational backbone of modern Islamic banking, capital markets, and takaful, and enabling the Islamic financial institutions to deliver services while preserving ethical and legal compliance. Although Islamic finance contracts may be categorised in various ways, however one of the common ways include partnership-based contracts, exchanged-based contracts, intermediation contracts and non-compensatory contracts (Adam, 2025).

- i. **Partnership-Based Contracts:** As one of the Islamic nominate contracts, they are equity-oriented financial arrangements in which two or more parties collaborate by contributing capital, labour, expertise, or a combination of these to undertake a Shariah-compliant business activity. Under these contracts, profits are shared according to a mutually agreed ratios, whereas financial losses must be absorbed according to each partner's capital contribution (Mirakhor and Krichene, 2023). Examples of these contracts include, *Mudarabah* (entrepreneur-investor arrangements), *musharakah* (joint ventures), and *Musharakah Mutanaqisah* (Diminishing partnership) (Adam, 2025).
- ii. **Exchange-Based Contracts:** They are also called trading or sales-based contracts and include those Islamic contracts in which parties exchange goods or services for a payment or consideration (Moqbel and Ahmed, 2021). The primary focus in these

contracts is to affect a transfer of ownership of an asset instead of lending or equity participation. Unlike partnership-based contracts, returns in the exchange or sales-based contracts are derived from trade rather than profit-loss sharing (Usmani, 2019; Elasrag, 2024). Examples include, *Murabahah* (Cost-Plus Sale), *Salam* (Advance Payment Sale), *Istishna* (Manufacturing or Construction Sale) (Adam, 2025).

- iii. Intermediation Contracts:** They are Islamic contracts in which the Islamic finance institutions act as an intermediary between capital owners and investment opportunities. These contracts are primarily used in investment and deposit accounts, where the financial institution pools capital from depositors and invests it in Shariah-compliant activities (Usmani, 2019). They differ from both partnership-based contracts and exchange-based contracts because the financial institution acts as a manager or trustee, rather than a co-investor or seller, assuming responsibility for managing the funds while adhering to Shariah guidelines. Examples include, *Wakala* (Agency), *Wasiyyah* (Will) etc (Adam, 2025).
- iv. Non-Compensatory Contracts:** They are unilateral or gratuitous contracts, aiming to support social solidarity and ethical redistribution of wealth in society. They are a direct opposite to the exchange or sales-based contracts, and thus, they are contractual arrangements in which one party provides benefit to another without the expectation or obligation of receiving any material return or compensation. Thus, such contracts are rooted in the principles of benevolence, charity and cooperation (El-Gamal, 2006; Usmani, 2002). Examples include, *qard* (benevolent loan), *kafalah* (guarantee), *hibah* (gift), *wagf* (endowment) (Adam, 2025).

### 3.3.2 Islamic Finance Products

Islamic financial products can broadly be categorised into participatory or partnership-based products and non-partnership-based or sales-based products (Hanif and Iqbal, 2010). While the non-partnership-based or sales-based modes such as *Murabahah*, *Salam*, *Istisna*, and *Ijara* offer relatively fixed returns structured around specific Shariah-compliant contracts, the participatory modes such as *Musharakah*, *Mudarabah*, and *Musharakah Mutanaqisah* are equity-based, and their returns are contingent upon the actual performance of the financed business. As such, these participatory modes embody the true spirit of risk-sharing and partnership, with profits and losses shared according to pre-agreed ratios (Hanif and Iqbal, 2010; Hassan and Lewis, 2009). Each of the categories is discussed below.

### **3.3.2.1 Non-Partnership-Based Products**

These products are generally built on the Islamic exchange or sales-based contracts. They are generally referred to as the Islamic alternatives of the existing conventional financial products as their economic substance quite often do not differ from the conventional counterparts (Javed et al, 2023). They are further divided into trade-based products and leased-based products. The trade-based products include, *murabah*, *salam*, *istisna* and the leased-based product is generally *ijarah*. For these products, the Islamic finance institution has pre-determined return which either comes from the sale value or periodic rentals on the leased asset. At their core, the non-partnership-based products require that the financier or institution assume some degree of ownership, possession, or risk in the underlying asset before selling it or its usufruct to the customer.

### **3.3.2.2 Partnership-Based Products**

The partnership-based products are the spirit of modern Islamic finance as they ensure the sharing of both risk and reward between the contracting parties (Javed et al, 2023). Proponents of modern Islamic finance especially the pioneers emphasised that, partnership-based products are the ideal modes of financing Ahmad (2000), Dusuki (2007) and Siddiqi (1985), and they should therefore dominate the operations of the Islamic financial institutions (Javed et al, 2023). Others such as Usmani (2007) and Khan (2010) even argue that non-partnership-based products should only be used where partnership-based products are not applicable. These partnership-based products form the core focus of this research, and they include. *Musharakah*, *Mudarabah* and *Musharakah Mutanaqisah*, each of which is discussed in detail in the succeeding sections.

## **3.4 Entrepreneurial Finance in Islam**

Islam does not only encourage entrepreneurship but also provides financing mechanisms that align with the principles of Islamic economic justice and the objectives of Islamic entrepreneurship. Islamic entrepreneurial finance refers to the exploration and utilisation of financing options within the confines of Shariah, aimed at supporting the creation and growth of enterprises in ways that are ethically grounded and socially responsible (Belabes, 2018). It encompasses both the means and the decision-making factors involved in mobilising funds for starting new ventures or expanding existing ones.

This research is exclusively focused on the participatory modes, particularly *Musharakah*, *Mudarabah* and *Musharakah Mutanaqisah*, as they are viewed as more consistent with the core values of Islamic economic and financial justice, fairness, and mutual benefit (Usmani, 2007; Siddiqi, 1985). These instruments have been repeatedly highlighted in the literature as ideal tools for promoting entrepreneurship, especially in Muslim-majority contexts (Ahmed, 2005; Kayed and Hassan, 2010; Al-Suwailem, 1998). Their structure ensures a fair distribution of risk and return, strengthening the ethical foundations of Islamic finance (Ahmed and Aassouli, 2022). Historically, the participatory modes were central to the financing infrastructure of the Islamic world. As noted by Udovitch (1970) *Musharakah* and *Mudarabah* were extensively used to mobilise financial capital for trade, agriculture, manufacturing, and crafts during the medieval Islamic period. These instruments not only facilitated cross-regional commerce but were also adopted by non-Muslims such as Jews and Christians testifying to their broader appeal and practical utility (Muhammad, 2014).

According to Usmani (2002) and Hanif and Iqbal (2010) the revival of these instruments formed the intellectual and functional basis of modern Islamic banking, positioning them as central to the development of an alternative to the conventional interest-based financial system. Empirical evidence suggests that entrepreneurs tend to prefer equity-based finance over debt, and banks have been observed to adopt participatory instruments to enhance their competitiveness and client base (Risfandy et al, 2020). Kayed (2012) further argues that participatory instruments are uniquely positioned to catalyse entrepreneurship, especially in economies where trust-based, long-term relationships are critical to business success.

In practice, Islamic entrepreneurial finance begins with a two-tier screening process to ensure Shariah compliance namely, Activity-Based Screening and Financial-Based Screening. The activity-based screening is the initial screen that filters out enterprises involved in prohibited (*haram*) activities such as alcohol, gambling, and interest-based financial services from the pool of eligible investees (Rizaldy and Ahmad, 2019). On the other hand, the financial-based screening assesses a firm's financial structure by examining key ratios such as debt levels, liquidity, and income derived from non-compliant sources. Only firms meeting specific Shariah financial thresholds are considered for funding (Rizaldy and Ahmad, 2019). The firms that pass both screens constitute the Shariah-compliant investable universe for the Islamic Financial Institutions thereby ensuring that the financing process upholds Islamic values from origination to execution. Thus, Islamic entrepreneurial finance anchored in participatory financing instruments presents a principled, inclusive, and risk-sharing alternative to conventional debt

financing. It aligns entrepreneurial activities with spiritual, ethical, and socio-economic objectives, making it a vital mechanism for sustainable SME development in the Islamic economic framework.

### **3.5 The Islamic Participatory Modes of Financing**

The Islamic participatory modes are found within the equity and equity-like financing products. They are generally understood to be the spirit and the essence of modern-day Islamic finance, which purports to be an alternative to the conventional debt-based financial system. As equity and equity-like financing arrangements, the capital provider is only entitled to return when the business venture financed by the capital is profitable and is also reported as such by the business operator. Risk-sharing is at the heart of these equity and equity-like Islamic participatory modes, which is different from risk-transfer model in conventional finance. This is why researchers such as Ahmed (2005) and Kayed and Hassan (2010) and Al-Suwailem (1998) submit that the literature on Islamic entrepreneurial finance suggests the use of the Islamic participatory modes of financing to finance entrepreneurs such as SMEs. These participatory modes propagate and accentuate the Islamic principle of economic justice and fairness, as it ensures a fair allocation of risk and reward between the financier and the entrepreneur Ahmed and Aassouli (2022). These modes of financing mainly include, *Musharakah*, *Mudarabah*, and *Musharakah Mutaniqisah*. In essence, the Islamic participatory modes offer a value-driven financial framework where risk, effort, and return are equitably distributed, and financial relationships are built on trust, ethics, and shared responsibility. This makes them particularly well-suited for SME and entrepreneurial finance, especially in contexts where access to ethical and non-exploitative financing is a developmental priority.

#### **3.5.1 *Musharakah***

The literal meaning of *Musharakah* is sharing or comingling, and its root word in Arabic is ‘*Shirka*’, which means being a partner (Hanif and Iqbal, 2010). According to Jobst (2017) *Musharakah* may be defined as an equity-like type of contract or investment arrangement, between two or more partners to jointly finance a business venture or project and share the risk and reward of the venture. Similarly, Farroq and Ahmad (2013), defined *Musharakah* as a participatory mode of finance that involves the sharing of profits and losses. Basically, *Musharakah* is a joint enterprise established to conduct a business in which all partners contribute some capital, and share the profits according to any agreed ratio, while losses are burned according to capital contributions or ownership stakes. *Musharakah* capital could be in

the form of cash, cash equivalent or non-cash assets (Hidayh et al, 2021). *Musharakah* contract is mainly divided into two types i.e., *Shirkatul-al-Milk* (partnership of joint ownership) and *Shirlatul-al-Aqd* (contractual partnership) (Farroq and Ahmad, 2013). Many notable contemporary researchers such as Usmani (1999) and Habib (2018) and Rahman et al (2020), and Yildirim (2021) have attempted to clearly highlight the distinction between *Musharakah* partnership and a normal equity investment, and contend that *Musharakah* contract is a project or venture specific investment tool, that entitles the investor to only the ownership of the venture or project financed by the *Musharakah* capital, while a normal equity investment grants its holder the ownership of the entire firm (Hadizada and Nippel, 2022). Thus, both *Musharakah* and equity are variants of profit and loss sharing investment tools, while their scope of ownership in respect of firm assets differ.

In the context of business and trade, Usmani (2002) opine that equity participation formula is a joint venture in which all partners share the profits and loss of the venture. *Musharakah* mode of financing SMEs is preferably the most ideal tool, as it is not as contentious as *Murabahah* or as risky as *Mudarabah* to the Islamic financial institution Kayed (2012). In a *Musharakah* contract, it is a pertinent requirement that the profit-sharing ratio as well as the capital contribution of each partner be agreed beforehand Rammal (2004) while losses are absorbed in proportion of capital contribution Usmani (2002) and equally, each partner is entitled to participate in the management of the business. However, the partner not participating in the management of the business may not have a profit share exceeding his share of investment based on ethical and equity considerations and the profit cannot be determined as a lump value or per centage of the capital invested (ELFakir and Tkiouat, 2015).

*Musharakah* as a financing tool promotes justice which is a vital aim of Islamic economic system (Usmani, 1998). In the *Musharakah* financing of an entrepreneur, the Islamic financial institution provides partial capital and, in most cases, becomes a somewhat inactive or silent partner, while the entrepreneur or the firm being financed equally provides partial capital and, in most cases actively runs the venture. As a 'skin-in-the-game' type of investment partnership, it is in the interest of both the entrepreneur and investor i.e., IFI for the venture to be successful. Hence, this alignment of their interest reduces the opportunistic behaviour of the entrepreneur. Additionally, in *Musharakah*, both partners are entitled to work for the venture and have a say in the management of the venture (Abdulsaleh and Worthington, 2013).

This mode of finance not only does it relieves the entrepreneur from the burden of fixed interest payments but it also slices out the need for collateral which generally impede many young

entrepreneurs from accessing finance, while generating a much better rate of return to the financier (Ibrahim, 2003). Hidayh et al (2021) conclude that *Musahrakah* financing facilitates the increase of business capital for SME entrepreneurs, provides access for take-off capital, increase business merchandise, add new products, and supports business expansion or even acquisition of new equipment. However, despite all these great benefits that accrue to both the entrepreneur and financier from the use of *Musharakah* mode of financing, factors like decay in entrepreneur's ethics and absence of specific regulatory framework MacMillan et al (2008) limited skilful entrepreneurs and poor accounting system Islam (2005), low level of awareness on specific products like *Musharakah* and tax issues Khattak and Rehman (2010) and Farooq and Ahmad (2013) are among some of the impeding factors contributing to the limited use of this mode of financing SMEs entrepreneurs.

### **3.5.2 Mudarabah**

*Mudarabah* is a trust-based business partnership financing arrangement between a capital owner and skilful manager in which profit generated by the partnership business is shared, while the capital owner bears the financial loss, even though the capital owner does not have the right to monitor or participate in the management of the business (Abdou-Gabal et al, 2011). It is also regarded as an Islamic profit-sharing partnership contract utilised by contemporary Islamic finance institutions, and it is synonymous with the Arabic terms like *Qirad* and *Muqaradah* (Rahman, 2018). The concept of *Mudarabah*, also known as *Qirad* or *Muqaradah* in classical Islamic jurisprudence, is rooted in Islamic commercial history and has been widely acknowledged across all major Sunni schools of thought (Rahman, 2018). While the Maliki and Shafi'i schools predominantly use the term *Qirad*, the Hanafi and Hanbali schools refer to it as *Mudarabah*. It is considered by classical and contemporary scholars as one of the most ideal Islamic financial instruments, especially for financing entrepreneurs and small and medium-sized enterprises (Ahmed, 2011).

*Mudarabah* is believed to have existed in the Arabian Peninsula before the advent of Islam (Conteh and Hassan, 2021). Moreover, its legitimacy has been confirmed and validated in the subsequent Islamic teachings (ISRA, 2010). A prominent example cited in Islamic economic literature is the business partnership between the Prophet Muhammad (PBUH) and Khadijah (RA) his wife, who provided capital for trade managed by the Prophet (Iqbal and Mirakhor, 2011; ISRA, 2010). It is also documented by Rahman (2018), that this mode of finance continues to be popular in the commercial association of the Arabs even after the advent Islam,

especially for their long-distance trading. Thus, it is not surprising that scholars unanimously agree on its permissibility (Ibn Munzir, 1999).

*Mudarabah* is defined by Gafoor (2006) as a profit sharing and financial loss absorbing contract between a capital owner (*Rabul- Mal*) and skilful entrepreneur (*Mudarib*). Thus, it is participatory arrangement between capital and labour for a business venture in which profit is shared while the financial loss is absorbed entirely by the capital provider (Febianto, 2009). *Mudarabah* can be used on the liabilities and assets sides of an Islamic financial institution. On the liability side the investors/depositors are *Rabul-mal* and the IFI is the *Mudarib*. On the asset side, the Islamic financial institution acts as a sponsor in the partnership, while the client becomes the business manager. The default relationship between a financier and an entrepreneur is characterised by information asymmetry. While this problem is reduced in the conventional loan contract through collateral and or other forms of securities Berger et al (2011) the Islamic contract of *Mudarabah* does not necessarily require such securities to be provided, although they may be provided in the case of negligence, breach of contract or misconduct (Usmani, 2002). However, in the event of a genuine loss, the capital owner bears the financial loss exclusively, while the skilful entrepreneur bears the fruitless efforts (Shaikh, 2011). Entrepreneurs or firms generally prefer the *Mudarabah*, especially the unrestricted, as it does not only give them the freedom to be in charge of their investment or financing decisions, but it also guarantees the non-interference of the capital provider in the management of the business (Kayani, 2023).

As a mode of finance, *Mudarabah* may be restricted or unrestricted. While the entrepreneur is at liberty to invest at his discretion in unrestricted *Mudarabah* (*Mudarabah Mutlaqah*), the financier decides on the investment mandate in the restricted *Mudarabah* (*Mudarabah Muqayyadah*). As professionals at what they do, Islamic finance institutions generally prefer the unrestricted *Mudarabah* on their liabilities side of the balance sheet Mazuin (2015) while preferring a restricted *Mudarabah* on the asset side in order to manage their exposure (Aderemi and Ishak, 2020). The dominant financial system and regulatory regimes such as the conventional financial and economic systems, are at best unfriendly to the use of *Mudarabah* financing. Thus, the Islamic financial institution which is normally the capital provider stands to lose the entire capital invested in *Mudarabah*, Miah and Suzuki (2020) as it entrusts the *Mudarabah* capital to the entrepreneur without recourse to anything. Notwithstanding, Biplob and Abdullah (2019) conclude that *Mudarabah*- based microcredit is one of the most popular

financing tools in Bangladesh. Similarly, Al Balushi (2019) report that *Mudarabah* tool is available and widely known by SMEs in Oman.

Generally, Islamic finance institutions around the world shun financing entrepreneurs using *Mudarabah* due to its inherent risk (World Bank Group and Islamic Development Bank, 2015). However, using restricted *Mudarabah* is somewhat very much appropriate in financing SME entrepreneurs due to the latitude of dictating the investment mandate (Sabri and Jalil, 2007). It has been argued by Aderemi and Ishak (2020) that the use of *Mudarabah* mode of financing will be very helpful to already existing SME entrepreneurs seeking to expand their business, since the bank would be able to adequately measure their ability (entrepreneurial skills) from their previous business performance. Similarly, Rahman (2018) contends that in financing SME entrepreneurs, *Mudarabah* may be used in business domains such as project financing, service sector, trade financing via LCs, industrial operations etc. *Mudarabah* mode of financing has been found by Kayani (2023) to be an ideal mode to finance and support the working capital management of entrepreneurs, more so during financial disturbance (Fernandes et al, 2021).

### **3.5.3 *Musharakah Mutanaqisah***

AAOIFI (2010), defines the *Musharakah Mutanaqisah* as a partnership in which one of the partners promise to buy the whole equity share gradually until the title of the equity is completely transferred to him. *Musharakah Mutanaqisah* is one of the Islamic modes of financing that is based on the concept of diminishing partnerships (Saad and Razak, 2013). It is one of the many hybrid Islamic contracts used to address the present day economic and financial needs of Muslims Juliyanti and Wibowo (2021) and it is a derivative product of *Musharakah* contract based on *Shirka-ul-inan* (OJK, 2016). Although it is an Islamic equity product, but it is relatively a new concept with its history dating back to the 1970s (Bendjilali and Khan, 1995). *Musharakah Mutanaqisah* is in principle a partnership that consists of two independent but related contracts that are executed separately to satisfy the goal of the partnership and shariah requirements. The arrangement begins with the joint ownership of an identifiable asset between the Islamic financial institution and the client typically an entrepreneur or SME operator who lacks the full capacity to acquire the asset independently. Through the partnership, the IFI finances a proportion of the asset, while the client gradually purchases the financier's share over an agreed period, eventually becoming the sole owner of the asset or project (Imronudin, 2015; Usmani, 2002).

In *Musharakah Mutanaqisah*, the repurchasing agreement is part of the contract, such that one part i.e., the client of the financial institution becomes the ultimate owner of the asset or project (Imronudin, 2015 ). Scholars and researchers are in agreement that *Musharakah Mutanaqisah* is an ideal instrument for entrepreneurs to acquire assets or related inputs for their businesses which ordinarily would have been difficult for them to acquire independently (Usmani, 2002; Bendjilali and Khan, 1995). It is argued that *Musharakah Mutanaqisah* as an innovative tool, can overcome the challenges in *Musharakah* and *Mudarabah* modes of finance for SMEs (Djemaa, 2018).

Operationally, *Musharakah Mutanaqisah* begins with the joint ownership (*Shirkatul-al-Milk*) of an asset between the client and the financier, typically an Islamic financial institution. For instance, the client may initially contribute 20 per cent of the purchase price, while the financier contributes the remaining 80 per cent, establishing co-ownership of the asset. Once the asset is jointly acquired often a leasable asset such as real estate or machinery, this concludes the first leg of the transaction, the *Musharakah*. The second leg involves the client leasing the financier's share (80 per cent) of the asset at an agreed rental rate (*Ijarah contract*). Concurrently, the client undertakes to gradually purchase the financier's ownership stake through periodic payments over time (Bay' contract), leading to a progressive transfer of ownership. With each instalment, the client's equity shares increase while the financier's decreases, until the client becomes the sole owner of the asset hence the term 'diminishing partnership'. Scholars have widely agreed on the permissibility and implementation mechanism of *Musharakah Mutanaqisah* (Saad and Razak, 2013; Abdullah, 2016), affirming its utility in asset acquisition and SME financing while aligning with the principles of Islamic economic justice and risk-sharing.

*Musharaka Mutanaqisah* is by far one of the most ideal financing modes for SMEs, especially for those that need assets that are crucial in their business activities. Although it is mainly used by Islamic finance institutions in home financing, it equally has a great potential in financing SME entrepreneurs. It is argued that *Musharakah Mutanaqisah* is the most suitable form of *Musharakah* for microfinance institutions (Aziz et al, 2023). It avails both the entrepreneur and financier the opportunity for equity participation while ensuring an exit mechanism for the financier and full ownership for the entrepreneur (Sadique, 2008; Dinc, 2017). Unlike *Musharakah* in which the equity of the bank is tied up until maturity, *Musharakah Mutanaqisah* allows for the gradual withdrawal of the co-financier's equity which not only reduce the related

equity risks but also allows for multiple investments or financing of SME entrepreneurs overtime (Boualem and Khan, 1996).

So far, amongst the Islamic equity modes, *Musharakah Mutanaqisah* is the most widely used for financing entrepreneurs (World Bank Group and Islamic Development Bank, 2015). The use of *Musharakah Mutanaqisah* to finance SME entrepreneurs could be the way forward for the alleviation of poverty sustainably Islam and Ahmad (2022) as it ensures the availability of a revenue generation asset into the ownership of a person in need. This mode of financing is suitable for SMEs at all stages including early stage, expansion stage and maturity stage (Imronudin, 2015 ). *Musharakah Mutanaqisah* is very much in line with the Islamic teachings on commercial transactions and it has the potential to derive enormous economic benefits to the parties involved (Abushareah and Naim, 2015).

### **3.6 Assessing the Suitability of the Islamic Participatory Modes for financing SMEs**

Islamic participatory modes of finance have historically been prevalent in the Arabian Peninsula, with their adoption and expansion significantly amplified following the advent of Islam, particularly during the golden age of Islamic governance (Conteh and Hassan, 2021). Askari et al (2012) contend that risk-sharing financing mechanisms, such as these participatory modes, predate the establishment of modern corporations, banks, or other formal financial institutions. Rooted in Islamic teachings from the *Qur'an* and *Sunnah*, the strength and purpose of modern Islamic finance in fostering shared prosperity are grounded in the use of risk-sharing instruments (Lajis, 2017). Risk-sharing embodies a rational and entrepreneurial approach whereby individuals pool their resources to jointly bear the risks and rewards of economic activities, an arrangement more efficient and equitable than risk-bearing in isolation as the case is in the mainstream conventional finance.

At the core of Islamic finance, these participatory instruments fundamentally distinguish Islamic financial institutions from their conventional counterparts. Instruments such as *Musharakah* and *Mudarabah* are especially suitable for SMEs and startups, which often face difficulties accessing debt-based financing due to limited collateral. Participation in business outcomes through profit and loss sharing is a defining characteristic that aligns Islamic participatory finance with the needs of SMEs (Jais et al, 2019). Nobel Laureate Robert Shiller has long advocated for risk-sharing financial instruments as effective tools for equitable economic development (Lajis, 2017). As defined by Askari et al (2012) risk-sharing refers to

‘a contractual or societal arrangement in which the outcome of a random event is borne collectively by a group of individuals, parties or entities involved in a contract, or individuals or entities in a community’.

Numerous Islamic scholars and researchers argue that these participatory modes are ideally suited for promoting socio-economic development by fairly distributing risk and reward between capital providers and entrepreneurs (Usmani, 1999; Saad and Razak, 2013). Rather than relying solely on collateral, the Islamic participatory finance focuses on the moral character and entrepreneurial capabilities of the prospective partners as a form of assurance (ElGindi et al, 2009). This approach opens access to finance for many honest and capable entrepreneurs who might otherwise be excluded from traditional financing mechanisms (Islam and Ahmad, 2020). Several empirical studies support the suitability of participatory finance for SME development. For example, Haron and Ibrahim (2016) argue that these instruments are particularly well-matched to the early and growth stages of SMEs, when access to capital is most critical and risk-sharing can foster survival and expansion.

Furthermore, the World Bank and Islamic Development Bank highlight that each participatory mode can significantly enhance financial inclusion and support innovation-led development (World Bank Group and Islamic Development Bank, 2015). Moreover, Islamic finance institutions that prioritise participatory instruments contribute more meaningfully to social welfare objectives (Hassan, 2015) and fulfil the broader goals of the Shariah (Šeho et al, 2020). As noted by Haron and Ibrahim (2016) Islamic risk-sharing contracts better realise the objectives of Islamic law by promoting equitable wealth distribution. Additionally, the risk-sharing structure of these instruments makes them more resilient to financial crises, as they reduce leverage and enhance risk management at both institutional and systemic levels (Kammer et al, 2015; Ali et al, 2020).

Despite their theoretical suitability and documented advantages, the Islamic participatory modes remain underutilised globally. Various studies point to several systemic, regulatory, and institutional barriers. However, this research focuses specifically on the personal qualities of SME entrepreneurs viewed as potential partners in Islamic participatory contracts as a possible determinant of IFI’s decision to engage in such financing arrangements. These qualities include trustworthiness, entrepreneurial and financial management skills, knowledge level on Islamic finance principles and products, relevant demographic and firm profile factors, and the willingness of SME operators to adopt participatory financing models. These factors are

explored as potential impediments to expanding the use of participatory modes in SME financing.

### **3.7 Some Major Challenges of Using the Islamic Participatory Financing Modes for SMEs.**

#### **3.7.1 Lack of Trust in SME Entrepreneurs**

Trust lies at the heart of nearly all economic transactions. Currall and Inkpen (2006) defined trust as a decision to rely on another person, a group or an organisation under a condition of risk. Trusting someone means to willingly make yourself vulnerable to the actions of another person or group or organisation based on your expectation that the trustee will perform certain action(s) important for your interest and welfare without the need to monitor or control (Mayer et al, 1995). As such, trust serves as a foundational element for all cooperative economic activities (Dupont and Karpof, 2020). Some researchers argue that trust is an important component in running a successful business in a global market deeply engulfed by an environment of risk and uncertainty (Maiolo and Zuffo, 2018). Trust is thus very important to encourage trustworthy behaviour Abdullah and Azam (2020) and very salient factor for entrepreneurial success (Bloem and Salimi, 2022).

Islam encourages entrepreneurs to incorporate trustworthiness, honesty, and truthfulness in their business dealings (Khalique et al, 2020). The level of information asymmetry in the Islamic participatory instruments is informed and accentuated by the dishonesty and untrustworthiness of the active partner about not reporting the true outcome of the partnership investment (Zafar and Nor, 2019). In participatory modes such as *Mudarabah* and *Musharakah* financing, the IFI provides the entire capital in the case of (*Mudarabah*) and partial capital in the case of (*Musharakah*), and the SMEs take on the role of active partners and manage the daily operations of the venture. The return to the IFI as a partner in both cases is contingent on the actual investment performance and the honesty of the active partner (SME) to truthfully disclose the true performance (profit) of the project which is then subjected to sharing as agreed ex-ante. To this effect, Ahmed and Aassouli (2022) elucidate that ethics could be a substitute for the costly control, monitoring and verifications involved in the entrepreneurial financing relationships, as ethical parties are expected to be truthful in providing information and fulfilling their contractual obligations. In fact, the absence of trust between two transacting parties is a form of an additional tax on the transaction which disadvantages both parties and

has the potential of increasing the cost of the transaction to about 50 per cent due to the need for supervision and control (Fukuyama, 1996. p 83).

According to Maxwell and Levesque (2014) higher levels of trust increase the level of equity financing for SMEs as well as the attractiveness of SMEs to equity investors. When equity financiers have trust in SME decision makers, they will make enough funding available to SMEs with sufficiently attractive terms amid information asymmetry (Dowling et al, 2019). Similarly, Kwon and Arenius (2010) opine that generalise interpersonal trust promotes investments in entrepreneurial opportunities, and the flow of venture capital funds is very much supported by the existence of bilateral trust as noted by (Bottazzi et al, 2016). In exploring factors that inform the decision of angel investors (who are akin to *Mudarabah* and *Musharakah* as equity investors) to reject some investment opportunities presented to them, Mason et al (2017) conclude that trustworthiness, entrepreneurial competence in terms of knowledge and experience and the personality of the entrepreneur are found to be critical in their decision to approve funding or otherwise.

Similarly, in examining the role of trust in the funding decisions of reward-based crowdfunding, Junqueira et al (2020) concluded that funders established trust first before making their final decision. According to Farroq and Ahmad (2013) the lack of interest and commitment from financiers resulting in the marginal use of *Musharakah* financing by IFIs is informed by lack of honesty and skilful entrepreneurs. Another study by Adnan and Purwoko (2015) also found lack of trust as a key factor what deter Islamic financiers from using participatory or risk-sharing financial instruments like *Mudarabah* and *Musharakah*. According to Naim (2016) a major challenge with the use of risk-sharing financing instruments is agency costs (pursuance of personal interest by the agent i.e., SME partner) as it gives incentive to the SME entrepreneur to understate the profits.

### **3.7.2 Poor Financial Management Skills of SME Entrepreneurs**

Financial management in broad terms is the management of the finances of a business to achieve the financial goals including raising the required funds and efficiently allocating this scarce resource amongst the competing business needs (Abanis et al, 2013). Financial management is a critical function in business management as each business transaction has a financial implication (Gawali and Gadekar, 2017). Therefore, the inefficiency in financial management results in poor performance and eventual collapse of a business entity (Kengatharan and Yougendarajah, 2017). A good financial management system is the

cornerstone of every successful business and organisation (Zada et al, 2019). In fact, many studies have argued that the success or failure of any business venture lies on its financial management practices (Kapitsinis, 2019; Busenitz et al, 2003; Abe et al, 2015). Most owner-managed SME entrepreneurs are daunted by the idea of bookkeeping and accounting, meanwhile, keeping track of incomes and expenses of the firm, improves the chance of making profit and to prepare appropriate tax returns, access bank loans amongst others (Siekei et al, 2013). According to Folajinmi and Peter (2020) the objective of proper financial management is to generate the highest investment returns at the lowest possible costs. Hence, financial management skills are crucial for operating small businesses and are needed to increase the survival rate of SMEs (Kirsten, 2018). Also, the level of funding available to SMEs has been found to be positively linked with the financial management skills found within the SME (Wolmanrans and Meintjes, 2015).

A perennial problem for most owner-managed SME operators is their inability to differentiate between personal and business finances. This lack of distinction between personal and business finances is by far the root cause of poor financial management for many owner-managed SMEs if not all. The lack of separation or rather the comingling of funds coupled with the inadequate financial knowledge of owner-managed SME entrepreneurs affect their ability to make appropriate investment decisions premised on sound feasibility analysis and planning (Kaya and Alphan, 2012; Karadag, 2015). Evaluating the true performance of any business or project is contingent on proper recording of its activities especially the financial transactions. Until recently, SME entrepreneurs are generally known to have no strategic outlook with regards to their financial matters which is a recipe for many of them becoming short-lived (Karadag, 2015).

Studies highlight that many SME owner-managers in their drive to establish themselves in their markets put most emphasis on the production and marketing of their products especially at the early stage with little to no regard for sound financial management which in many cases results in their failure (Jindrichovska et al, 2013). In Kenya for example, Waweru and Hgugi (2014) studied the influence of financial management of SMEs on their performance and concluded that innovative financial management impacts SME performance strongly. Güngör and Öndeş (2013) reported that the lack of appropriate financial management for SMEs using equity financing and leads to significant amounts of financial losses and impacts employment negatively. Lack of financial management knowledge and the uncertainty that is inherent in SMEs businesses leads to poor financial performance and eventually SME failures (Gawali

and Gadekar, 2017). For Vohra and Dhillon (2014) the profitability of SMEs is a function of effective financial management practice. Thus, proper financial management is critical for all business organisation irrespective of size (Bismark and Frank Kofi, 2018). Similarly, Adebisi et al (2017) also established a significant relationship between financial management practices and SME performance.

### **3.7.3 Poor Entrepreneurial Skills of SME Entrepreneurs**

Entrepreneurship is fundamentally personal, as it takes human vision, intension, and work to conceive and translate business ideas into successful products and services (Baum et al, 2007). (Jardim, 2021) defined entrepreneurial skills as the set of knowledge, attitudes and skills that enable an entrepreneur to successfully and profitably develop products and services to suit the taste of his target customers in the society in their business. Similarly, Grace Jamie and Oliver (2020) opine that entrepreneurial competency is the cluster of related knowledge, attitude, and skills that an entrepreneur must have to deliver outstanding performance and maximise profit for the business. The individual is quite central in the running of SMEs, as the individual searches for the opportunities for the business and makes decisions as well as sets strategies that either make or break the venture. Therefore, SMEs existence and success or the otherwise revolves around the individual human beings and various skill sets they possess. Thus, the creation and success of small firms is understood through the lens of entrepreneurial skills or competencies of the person in charge (Mitchelmore and Rowley, 2010).

In Islamic participatory modes such as *Mudarabah* and *Musharakah*, the *Mudarib* or the active partner uses his or her entrepreneurial skills to make appropriate business and investment decisions to preserve both the business capital and make a decent margin for the success of the venture. Thus, the selection of an SME partner with the right skills and experience becomes a cardinal prerequisite for any possible returns on these modes of investment and preservation of business capital (Yustiardi et al, 2020).

The review of the extant literature points to the critical role of entrepreneurial competencies which are mainly intangible in nature on SME performance (Kabir et al, 2017). There is a positive relationship between entrepreneurial skills and firm performance reported by studies such as (Chell, 2013). Entrepreneurial skills management and funding were found to have a significant influence on SME performance in northern Nigeria (Bello et al, 2015). Zizile and Tendai (2018) conclude that SME survival and the success of SMEs are positively influenced by entrepreneurial competency. Similarly, within the spheres of entrepreneurship, Tehseen and

Ramayah (2015) argue that the creation, survival and sustained performance of the SMEs, anchors on the entrepreneur's competencies or skill sets while Nakhata (2018) concludes that the growth and profitability of the SME firm is driven by the entrepreneurial competencies. Entrepreneurial competence does not only support firm performance, but it equally provides a sustainable competitive advantage for the firm (Ahmad et al, 2018).

Undoubtedly, entrepreneurial competencies enable SMEs to navigate turbulent and unpredictable economic circumstances such as Covid-19, financial and monetary crisis such as GFC 2007/8 etc., (Khan et al, 2021). Although weak and small, but Astuti et al (2019) conclude that entrepreneurial skills have a direct link on SME firm performance. Ahmad et al (2010) also reported that entrepreneurial competencies are strong predictors of business success in SMEs. Higher entrepreneurial and managerial competencies were found to be strongly linked with the firm's financial performance (Kang, 2009). (Mitchelmore and Rowley, 2010) and (Mohsin et al, 2017) empirically examined the impact of entrepreneurial competencies on firm performance and found a strong and positive relationship (Mohieldin et al, 2012).

#### **3.7.4 Knowledge level, Willingness, Firm Profitability and Other Entrepreneur Attributes**

Knowledge, awareness and understanding of a product are always foundational and critical for the creation of a positive perceive value, leading to an eventual adoption or patronage. Arguably, although the Islamic participatory modes can be said to be not new in the financial services industry, but they are not as commonly understood as the plain-vanilla conventional loan products or even the Islamic debt or sales-based products, which are akin to their conventional counterparts. Moreover, empirical evidence has validated the position that knowledge, awareness and understanding are solid precursors for intention to adopt and usage (Ezeh and Nkamnebe 2021; Kamarudin, 2022). By the same token, Haruna et al (2024) examined the factors that determine the adoption of Islamic finance products in a non-Islamic country such as Cameroon and concluded that desire to comply with the Islamic Law, awareness, attitude and intension were critical determinants for the decision to adopt Islamic finance products by SMEs in Cameroon.

Many researchers have also undertaken to investigate the willingness of SME entrepreneurs to use the Islamic participatory modes of financing. For instance, Seddiq et al (2024) attempt to predict the behaviour of Moroccan SMEs managers towards participatory financing by looking at the potential factors that could influence the desire for adoption. The findings suggest that

factors such as attitude, subjective norms, and perceived behavioural control significantly influence their intention to adopt participatory financing. Similarly, Al Balushi et al (2019) studied the Omani SME perceptions towards the Islamic financing system. The findings indicate that SMEs are willing to partner with Islamic banks in their business financing arrangements. Thus, they saw participatory modes such *Musharakah* in a positive light. Furthermore, certain entrepreneur and firm specific attributes are found to be critical in influencing SME entrepreneurs' access to finance as well as the financing choice that they seek. For instance, studies such as Ajagbe (2012) Musamali et al (2013) Kirschemann (2016) Stefani and Vacca (2015) Nizaeva and Coskun (2018) Ferrando and Mulier (2015) Belén Guercio et al (2020) have all confirmed that the educational achievement of the SME operator, operator's age as well as the age of the firm, operator's attitudes towards loans and fear his fear loan of rejection, the ownership structure of the firm, as well as firm size and the industry in which the firm operates significantly influence the overall access and the choice of financing that SME entrepreneurs seek. Hence, these and many other idiosyncratic factors have been examined in this study.

### **3.8 Probing Psychometrics and Data Mining for Solutions: A Conceptual Review**

#### **3.8.1 Psychometrics**

Psychometrics is literally understood as the measurement of the mind (Alibhai et al, 2018). It is a subfield of psychology that involves the design and application of assessment tools to evaluate personality traits, skills, knowledge, abilities, attitudes, and other psychological characteristics (Rust and Golombok, 2014; Ahmad et al, 2020). Aitken (2017) defines psychometrics as standardised tests used to determine an individual's behavioural, mental, and cognitive capacities, offering predictive insight into potential behaviour across various contexts. In essence, psychometrics provides a mathematical approach to understanding and predicting human behaviour. Traditionally, psychometric tools have been employed primarily in human resource management, where employers use them to select suitable candidates from large pools of applicants often outperforming conventional recruitment techniques such as interviews, references, academic qualifications, and peer assessments. According to Khwaja et al (2013) there are approximately 2,500 companies in the United States that develop and market psychometric tests for employee selection, and the demand continuing to grow.

This same challenge of selecting trustworthy and competent individuals from a pool of applicants applies to Islamic financial institutions when evaluating SMEs for participatory modes of financing. The conventional paradigm in credit scoring relies heavily on quantifiable data such as credit histories and financial statements. However, a shift toward subjective credit scoring which incorporates psychological characteristics has gained momentum following the seminal work of (Khwaja et al, 2013). Indeed, academic research has long acknowledged that loan repayment behaviour is influenced not only by financial metrics but also by psychological and behavioural factors (Gagarina and Shantseva, 2017; Liberati and Camillo, 2018).

The proven success of psychometric assessments in human resource settings has inspired their application in finance, particularly for assessing credit risk in SMEs and predicting default likelihood. According to LenddoEFL (2021) psychometric tests are in use across more than 50 countries and have demonstrated the capacity to predict financial behaviour with over 91 per cent accuracy. Moreover, Sifrain (2020) has highlighted the cost-effectiveness and scalability of psychometric tools, while McKinsey (2010) reports that psychometric tools are approximately 45 per cent less expensive than traditional credit evaluation techniques. One of the most innovative applications of psychometrics in finance has been in addressing the limitations of traditional SME credit screening mechanisms.

The Entrepreneurial Finance Lab (EFL) at the Centre for International Development Harvard University, pioneered the development of psychometric screening tools aimed at reducing information asymmetry and facilitating access to credit for ‘thin-file’ borrowers those with little or no formal credit history (Sifrain, 2020; Klinger et al, 2013). These tools operate on the premise that certain psychometric attributes such as integrity, conscientiousness, and risk-taking behaviour are predictive of a borrower’s likelihood to repay. This approach has the potential to expand access to credit for those who would otherwise be excluded under conventional credit filters, without increasing default risk (Finberg, 2016). Research supports the claim that personal characteristics influence financial decisions and credit risk. For instance, Brown and Taylor (2014) and Dlugosch et al (2018) confirm the significant role of personality traits in shaping financial behaviour, while Khwaja et al (2013) and Sohn (2016) highlight the relationship between integrity and credit default risk. Furthermore, Moro and Fink (2013) found that integrity viewed as a proxy for a borrower’s willingness to repay remains a key consideration for loan officers in their credit assessments.

Empirical studies further validate the efficacy of psychometric tools. Irani Arráiz et al (2017) using data from a major Peruvian bank, revealed that over 59 per cent of applicants with no

credit history were successfully granted loans through psychometric assessment, without compromising credit quality. The Inter-American Development Bank reported that the use of psychometrics in credit decision-making reduced defaults by 20 to 45 per cent, cut operational costs by 40 per cent, and increased profits by 15 to 30 per cent (Inter-American Development Bank, 2013). Baklouti (2014) along with Pablo et al (2015) and Dlugosch et al (2018) and Azma et al (2019), and Ganbat et al (2021) have all concluded that psychological attributes are strong predictors of credit risk more so than even economic indicators in some cases.

From an entrepreneurial perspective, Frese and Gielnik (2014) assert that psychometric assessments can be utilised to evaluate an individual's likely behavioural orientation towards entrepreneurship and its subsequent effect on business outcomes. In this context, psychometrics presents a potential solution to the challenges hindering the broader application of Islamic participatory or risk-sharing financial instruments in SME financing. By providing a more nuanced, cost-effective, and scalable method for assessing the trustworthiness and entrepreneurial competence of SMEs, psychometric tools could help bridge the trust deficit and reduce the information asymmetry that often deters IFIs from engaging in risk-sharing contracts such as the participatory modes especially for SMEs who are mostly privately held businesses.

### **3.8.2 Data Mining**

According to Islam and Habib (2015 p. 1) data mining is defined as 'an iterative process that combines business knowledge, machine learning methods and tools, as well as large amounts of accurate and relevant information to enable the discovery of non-intuitive insights hidden in the organization's corporate data'. Similarly, Zaki et al (2020, p.12) describe data mining as 'the process of discovering insightful, interesting, and novel patterns in data, as well as descriptive, understandable, and predictive models from large-scale data'. In essence, data mining facilitates the extraction of meaningful insights from vast quantities of data, allowing decision-makers to address issues backed by empirical evidence. Hence, data mining thus, allows for the extraction of important insights for matters and issues for which a large amount of information exists (Safarkhani and Moro, 2021). For this reason, data mining is often referred to as Knowledge Discovery in Databases Song and Ying (2015), with the terms used interchangeably in much of the literature.

In today's data-driven world, data mining has become an invaluable tool for businesses and organisations particularly financial institutions, to unlock the potential of their vast repositories

of client data. As digital technologies, artificial intelligence (AI), and data analytics continue to reshape the business landscape, decision-making processes are increasingly integrated with these innovations (Verma et al, 2019). Despite having large volumes of valuable client data, many organisations have only recently begun to extract actionable insights due to advancements in computing power and AI technologies. These insights are now transforming how businesses especially financial institutions make informed decisions. In this context, decision trees have emerged as one of the most influential and widely applied data mining techniques for classification tasks (Gunduz and Lutfi, 2021).

A decision tree can be defined as a flowchart-like structure that formulates a set of decision rules to serve as a predictive model (Islam and Habib, 2015). Alternatively, it is a set of hierarchical decision rules visually represented in the form of a tree (Yeo and Grant, 2018). Decision trees belong to the family of supervised learning algorithms, which aim to construct a predictive model during a training phase that is later used to classify or predict the target variable based on learned decision rules (Jijo and Andulazeez, 2021). As a decision-support tool, the central goal of decision tree classification is to classify new instances accurately based on prior training data (Gupta et al, 2017). One of the major advantages of the decision tree technique is its ability to segment and classify data into clearly defined categories, often outperforming traditional methods such as logistic regression (Cizel, 2018; Morol et al., 2014). The decision by Islamic Financial Institutions to finance small and medium-sized enterprises using Islamic participatory financing modes is a significant one. Given the inherent risks of SME financing and the additional complexities of participatory contracts, robust decision-support tools are essential. In this context, decision tree classification offers a compelling statistical technique capable of predicting the suitability of SME applicants for such financing modes based on previously learned classification rules.

Several studies have demonstrated the efficacy of decision trees as a powerful data mining tool for decision-making. For instance, (Ardhana et al, 2024) applied a decision tree algorithm to identify patterns and key determinants influencing the sale of pharmaceutical products, using variables such as drug type, price, sale timing, and promotional activities. The model achieved an impressive overall prediction accuracy of 80 per cent. Similarly, Tarawneh et al (2022) used a decision tree-based classification model to support early detection of breast cancer using a dataset of 286 patients, accurately classifying cases as benign or malignant. The model achieved 100 per cent accuracy during initial trials and 97 per cent in follow-up tests. Golbayani et al (2020) applied various machine learning models, including Bagged Decision Trees and

Random Forests, to predict corporate credit ratings. By training on financial and market data, the models sought to replicate and potentially improve upon ratings given by agencies like S&P, Moody's, and Fitch. The findings of the study indicate that Tree-based models especially ensemble methods produced highly accurate credit classifications, demonstrating their potential to match or even outperform traditional agency models.

Islam and Habib (2015) used a pruned decision tree classification model to identify the most promising business sectors for SME financing. Using the client transactional data from a retail bank in Bangladesh, the findings indicated that the decision tree technique has effectively identified sectors with lower credit risk. More recently, (Wang, 2025) explored the application of Decision Tree Model in Personal Credit Scoring with a view to optimise fairness in the scoring. The findings of the study indicate that the decision tree models utilised were able to reduce biases to a very large extent. These examples underscore how decision trees can effectively support classification-based decision-making, especially when sample sizes are moderate and interpretability is critical.

In this study, the primary objective is to discriminate among SME applicants to support the Islamic Financial Institution's decision-making concerning the use of participatory financing instruments. The integration of psychometric assessment which measures relevant behavioural and cognitive traits with the decision tree data mining technique provides a promising approach for achieving this objective. By combining behavioural insights with machine learning-based classification, this model aims to reduce information asymmetry, enhance trust, and improve the precision of financing decisions in Islamic participatory finance. In the context of Islamic finance, applying decision tree models to psychometric and operational data can help predict SME suitability for participatory financing modes.

## **3.9 Empirical Review and the Research Conceptual Framework**

### **3.9.1 Trust**

Alshater et al (2026) conducted a hybrid review combining bibliometric and systematic analysis of reward-based crowdfunding literature. Drawing on a large body of existing studies, the research identifies key determinants of campaign success. The findings highlight that trust, transparency, and communication are central to backer engagement. Frequent updates and clear information reduce uncertainty, thereby strengthening trust and increasing the likelihood and magnitude of investment.

Hosni and Talbi (2025) examined the challenge of trust formation in crowdfunding through a conceptual and model-based approach. The study highlights the impact of information asymmetry on investor confidence. The findings indicate that a lack of reliable information undermines trust and limits participation. To address this, the authors propose expert-based evaluation mechanisms as a means of enhancing credibility, thereby improving trust and encouraging greater investment activity.

Nayer et al. (2024) examined the motivations and behaviours of crowdfunding backers using survey data collected from platform users. The study offers empirical evidence on the factors influencing individual investment decisions. The findings suggest that personal relationships, familiarity with project creators, and perceived risk play a central role in shaping funding behaviour. In this context, trust is embedded within social ties, influencing not only the likelihood of investment but also the level of financial contribution.

Junqueira et al (2020) examined the role of trust in the funding decision making of investors in a reward-based crowdfunding campaign. Collecting the study data from an array of sources including interviews, online discussions, and social media platforms of reward-based crowdfunding campaigns. The study's findings indicated that, reward-based crowdfunding participants build trust first before making their final funding judgements. Thus, it could be understood from the findings that, trust determines whether the Crowdfunders invest or not, and should he decide to invest, how much to invest in the campaign project.

Dowling et al (2019) evaluated trust and SME attitudes toward equity financing for SMEs. Using a large pool of over 20, 000 SMEs from 26 European countries. The study concluded that the existence of trust has a direct and explicit link with the use of equity financing for SMEs. The study confirmed that national interpersonal trust and institutional trust positively influences SMEs attitude toward equity financing and thus conclude that trust is vital in determining SME attitudes towards their financing choices.

Zafar and Nor (2019) studied the determinants of return on investment for *Mudarabah* and *Musharakah* contracts in Pakistan. Study's data was collected from annual reports of 23 *Mudarabah* companies from 2011 to 2015. The results of the study indicated that agency cost which is triggered and accentuated by misalignment of partner interests, lack of trust and honesty of agents have a strong and positive impact on the ROI of *Mudarabah* and *Musharkah* investments. Thus, trust accounts for the major reason for the limited use of these contracts in financing.

Bidault et al (2018) examined the willingness to rely on trust in a global business collaborative venture where both partners are at risk. The study's data was collected via a questionnaire from seven hundred and twelve executives from 38 different countries across the globe. The overriding aim of the study is to examine the willingness to rely on trust in entering a collaborative business arrangement such as the Islamic participatory modes of financing for SMEs. The study concluded that, context-driven variable such as firm-specific variables and demographic variables i.e., entrepreneur characteristics both influence the willingness of the executives i.e., investors to rely on trust in a collaborative business arrangements where both parties are at risk.

Lajis (2017) examined the role of risk-sharing securities in financing SMEs to optimise the true potential of Islamic finance. Using a simulation methodology, the study concluded that the use of blockchain and distributed ledger technology (DLT) and smart contracts could improve the appeal for the use of risk-sharing instruments for SMEs which are presently impeded by lack of trust.

Bottazzi et al (2016) examine the effect of trust on financial investment and contracting decisions in a micro-economic environment where trust is exogenous. The study used a survey method to collect the data from seven hundred and fifty venture capital firms from 15 European countries for investments made from 1998 to 2001. One of the key questions of the research was to examine whether generalised trust affects the likelihood that a venture capital firm will invest in a startup company? Using the Eurobarometer survey data of bilateral trust among nations as a measure of trust. The study concluded that there is a positive effect of trust on the flow of investment capital from venture firms among countries with bilateral trust. The study established that with one percent point increase in trust, there will be a seven percent point increase in the probability that an investment is made.

Abdul-Rahman and Mohd Nor (2016) examined the challenges of profit and loss sharing financing in Malaysian Islamic banks. The study's data was collected through interviews from Islamic finance professionals from Islamic banks in Malaysia. The results of the study established that chief amongst the major challenges in the application of Islamic risk-sharing financing instruments by Islamic banks is the difficulty in the selection of genuine entrepreneurial partner, which revolves around ethical considerations of the bank partner i.e., trust, trustworthiness, and honesty of the prospective partner in the use of profit and loss sharing financing instruments.

Hain et al (2016) examined the effects of relational and institutional trust as determinants of cross-border venture capital investments. Using the global venture capital flow for a twelve-year period from 2000 to 2012. The findings of the study indicated that trust is a major determinant of early-stage equity investment from venture capitalists, where institutional trust is more relevant for investments in emerging economies, and relational trust is more relevant for investments in developed economies.

Adnan and Purwoko (2015) analysed the factors that influence the low *Mudarabah* financing according to the perspective of Islamic bank management with a critical approach. One of the major findings of the research contended that lack of trust in the prospective partner is a key factor that deter Islamic financiers from using risk-sharing financing instruments like *Mudarabah* and *Musharakah*.

Based on the above empirical studies, the below hypothesises are postulated:

**H1<sub>0</sub>:** The trustworthiness of the SME entrepreneur does not have a strong and positive relationship with firm performance.

**H1<sub>1</sub>:** The trustworthiness of the SME entrepreneur does have a strong and positive relationship with firm performance.

### **3.9.2 Financial Management Skills**

Malkus et al. (2025) developed and examined a financial management system designed for SMEs, focusing on cash flow forecasting and accounts receivable prediction. Using real-world deployment data from SMEs and freelancers, the study applied quantitative modelling techniques. The findings showed that structured financial management systems improve cash flow accuracy, reduce payment uncertainty, and support better financial planning. Consequently, the use of digital financial tools enhances overall SME financial stability and decision-making capacity.

Salamiand and Aghaunor (2024) examined the influence of financial literacy and leadership on the performance of small and medium-scale enterprises in Nigeria. Using a cross-sectional survey design, data were collected from 1,341 SME owner-managers across multiple sectors. The findings revealed that both financial literacy and leadership practices have a significant positive effect on SME performance. In this context, financial literacy enhances decision-making efficiency, while effective leadership strengthens resource allocation and operational performance.

Rombaldo Junior et al (2023) conducted a systematic review of cybersecurity and financial constraints in SMEs using 77 selected studies from a larger pool of literature. The findings revealed that SMEs face significant financial management challenges due to limited resources, low financial literacy, and constrained investment capacity. These limitations reduce their ability to adopt advanced financial and operational systems, thereby affecting overall business performance and resilience.

Folajinmi and Peter (2020) examined the financial management practices and performance of small and medium scale poultry industry in Ogun State, Nigeria. Using a survey design, the study's data was collected from 162 SME poultry farmers. The study revealed that, all the financial management variables had a strong and positive effect on the performance of the firm. Hence, the present of financial management skills in SME entrepreneurs will facilitate the use of the Islamic participatory instruments and the otherwise is true.

Zada et al (2019) investigated the effect of financial management practices on the development of small-to-medium size forest enterprises in Pakistan. The study used questionnaire to collect data from 260 SME owners, finance managers and finance staff of SMEs. The results of the study indicated that a significantly strong positive correlation between financial management practice and firm growths. The improvement of financial performances in small firms using financial management practices offers valuable implications for owners, managers, and regulators and is a crucial factor for the success of SMEs, which is important in the Islamic participatory modes of financing.

Kirsten (2018) examined the role of financial management training in developing skills and financial self-efficacy. A quasi-experimental study using a pre-test-post-test single-group design was applied using self-administered questionnaires. Collecting data from 43 participants, the results of the study established that financial management skills are crucial for operating small businesses and are needed to increase the success and survival rate of SMEs. Moreover, the presence of financial management skills induces financiers to use Islamic risk-sharing financing since it contributes to firm profitability is which key for their investment returns on these instruments.

Adebiyi et al (2017) studied the implications of finance on the performance of SMEs in Lagos state, Nigeria. Using a survey research design, the research data were collected from 250 SME owners. Utilising Pearson correlation and regression analysis, the findings of the study established a significant relationship between financial management practices and SME

performance. This supports the hypothesis that lack of financial management skills will limit the use of Islamic participatory instruments whose returns are linked to firm performance or profitability.

Kengatharan and Yougendarajah (2017) examined the effect of financial management practices and performance of SMEs in Sri Lanka focusing on the district of Jaffna. The research data were collected from 60 SMEs operating in the district of Jaffna using a stratified sampling technique. The results of the study showed that good financial management practice impacts firm performance and inefficiency in financial management results in poor performance and eventual collapse of a business entity. Therefore, inefficiency in financial management will undoubtedly limit the use of Islamic risk-sharing financing.

Gawali and Gadekar (2017) explored the financial management practice in SMEs with the objective to establish its relationship and impact on the firm performance. The study selected limited but relevant national and international research papers based on non-probability based purposive sampling method. The study highlighted the significance of better financial management decisions based on efficient financial management practices which are critical and crucial for the survival, growth, and profitability of MSMEs. The study concludes that accounting and financial knowledge, competencies in interpreting the financial statements, owner-managers attitudes, and their level of involvement in financial aspects of business largely responsible for the success or failure of MSMEs. Thus, crucial financial management skills are a major determinant of using risk-sharing financing and their absence impedes their usage.

Wolmanrans and Meintjes (2015) studied the financial management practices in successful SMEs in South Africa. A questionnaire was used to collect the research data from 30 SME owners or managers in Western Cape. Research has shown that the lack of financial management skills and application of financial management practices are some of the biggest factors contributing to SME failure and contribute to funding constraints. Results in this study showed that the level of funding available to SMEs has been found to be positively linked with the financial management skills found within the SME. This is particularly relevant for the use of the Islamic participatory modes.

Vohra and Dhillon (2014) investigated the relationship between best financial practices and the financial performance of SMEs. A questionnaire-based field survey was conducted to collect data from 103 owner or managers from a random sample of SMEs located in the 4 cities of

Punjab state of India. The findings of the study concluded that the profitability of SMEs is a function of effective financial management practice which is premised on adequate financial management skills. Thus, for a firm to become profitable and provide adequate returns on the Islamic participatory instruments, financial management skills become the cornerstone.

From the above empirical studies, this research hypothesises that,

**H2<sub>0</sub>:** The financial management skills of the SME entrepreneur does not have a strong and positive relationship with the IFIs decision to use the Islamic participatory modes.

**H2<sub>1</sub>:** The financial management skills of the SME entrepreneurs do have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes.

### **3.9.3 Entrepreneurial Skills of the SME Entrepreneur**

Hussain and Ismail (2025) conducted a systematic review of Islamic financing instruments used in SME development, focusing on Mudarabah, Musharakah, Ijara, and Salam contracts. The study analysed peer-reviewed literature from 2020–2024. The findings reveal that while Islamic equity financing is widely recognised as a sustainable alternative to conventional financing, its adoption remains limited due to insufficient entrepreneurial skills and low financial awareness among SME owners. The study concludes that capacity building is essential for improving the effectiveness of Islamic financing mechanisms.

Saad et al. (2025) investigated the role of Islamic microfinance in supporting SMEs across Bangladesh, Malaysia, and Turkey. The study used secondary data and systematic review techniques to analyse Islamic microfinance practices, including profit-and-loss sharing instruments such as Musharakah and Mudarabah. The findings suggest that Islamic financing contributes to SME development and poverty reduction; however, its effectiveness is strongly influenced by the managerial and entrepreneurial capabilities of beneficiaries. In this context, improved entrepreneurial skills enhance the successful application of Islamic equity-based financing.

Rahman and Karim (2024) analysed the impact of Islamic equity financing on SME growth in Malaysia using a quantitative survey design and PLS-SEM analysis. The study collected data from 310 SMEs engaged with Islamic financial institutions. The findings show that Musharakah and Mudarabah financing have a positive effect on SME growth, but their effectiveness depends on the managerial capability and financial literacy of entrepreneurs.

Thus, entrepreneurial competence is identified as a key moderating factor in the success of Islamic financing arrangements.

Saeed et al. (2023) examined the determinants of Islamic financing adoption among SMEs in Sub-Saharan Africa using survey data collected from 412 enterprises. The study employed regression analysis to test the relationship between financial capability and financing choice. The findings indicate that SMEs with stronger financial management and entrepreneurial competencies are more likely to adopt Islamic financing modes, including *Musharakah* and *Mudarabah*. In this context, entrepreneurial skills play a critical role in determining financing accessibility and utilisation.

Islam and Ahmad (2020) examined the applicability of *Mudarabah* and *Musharakah* as Islamic equity financing instruments for the underprivileged women in the Selangor state in Malaysia. The study's data were collected from 330 women entrepreneur who are members of an MFI called Amanah Ikhtiar Malaysia (AIM). Using EFA, CFA and SEM. The findings of the study indicated that amongst other things, the application of *Mudarabah* and *Musharakah* financing instruments will significantly increase and be viable if the entrepreneurial skills of the members or clients improved.

Yustiardi et al (2020) investigated the issues and challenges of the application of *Musharakah* and *Mudarabah* in the financing products of Islamic banks. Using library-research to collect the study's data. Amongst its many findings, the study also concluded that the challenge of selecting the right partner for use of *Musharakah* and *Mudarabah* modes of financing also contribute to the limited use of these participatory modes of financing especially for smaller firms that do not have enough records or experience to show their viability and appropriateness in handling the underlying project(s).

Jais et al (2019), explored the issues and challenges of *Musharakah* and *Mudarabah* as an equity mode of financing for Islamic banks. Using content analysis methodology, the study concluded that entrepreneurs' lack of skills and experience in doing the business is a major factor contributing to the limited use of these participatory financing instruments by Islamic banks generally. Thus, the study suggests that Islamic banks should ensure that their partners in the participatory financing have the right skills and experience especially in *Mudarabah* financing where the bank stands to lose everything.

Astuti et al (2019) studied the entrepreneurial skills and SME's business performance by investigating the relationship and influence between them. A quantitative data was collected

via questionnaire from over 300 SMEs in Malang City. The results of the study established that entrepreneurial skills have a direct link on SME firm performance. Thus, any factor that contributes to the performance of an SME firm is critical for risk-sharing instruments since investment returns are determined by the actual firm performance in the use of these instruments.

Zizile and Tendai (2018) investigated the importance of entrepreneurial competencies on the performance of women entrepreneurs in South Africa, to establish a relationship between entrepreneurial competencies and the performance of women entrepreneurs and to suggest strategies that can be implemented to improve entrepreneurial competencies of women entrepreneurs. Using a quantitative research design and questionnaire to collect the data. The findings of the research confirmed that entrepreneurial competencies are crucial for the survival and performance of SMEs. Since SME success is crucial for risk-sharing financing, the presence or absence of entrepreneurial skills or competencies become a cardinal requisite for risk-sharing financing.

Nakhata (2018) examined the relationships between human capital, entrepreneurial competencies, and career success of SME entrepreneurs in Thailand which is very important for risk-sharing financing. A questionnaire was used to collect data from 388 participants and SPSS was used to analyse the data. The results of the study indicated that the growth and profitability of the SME firm is driven by the entrepreneurial competencies. This implies that successful entrepreneurs are those who have relatively high levels of human capital and entrepreneurial competencies. Thus, being performance-centric investment return-based instruments, the presence of higher entrepreneurial skills will support the use of these instruments, its absence alludes to its limited use.

Ahmad et al (2018) examined the entrepreneurial competencies and firm performance in emerging economies, A study of women entrepreneurs in Malaysia. Using a questionnaire, the study's data were collected from 117 women entrepreneurs. The findings of the study indicated that entrepreneurial competence does not only support firm performance, but it also provides a sustainable competitive advantage for the firm. Therefore, entrepreneurs with higher entrepreneurial skills will motivate Islamic finance institutions to finance them using the participatory instruments.

Mohsin et al (2017) assessed the role of entrepreneurial competencies on innovative performance of SMEs in Malaysia. A questionnaire was distributed to over 1000 companies in

all the 13 states in Malaysia to collect the study data. The findings from this study clearly show that entrepreneurial competencies are indeed important for Malaysian SMEs' economic success. The success of Malaysian SMEs is very much affected by the entrepreneurs' competencies in accelerating innovative performance. From this study, there is a consensus that some of the entrepreneurial competencies influence innovativeness. Therefore, the entrepreneurial competencies of prospective investment partner for Islamic risk-sharing financing occupies a key position in the investment decision making, since it contributes to SME's economic success.

Elasrag (2016) explored Islamic finance for SMEs with a focus on the opportunities and main challenges of Islamic finance for SMEs. Using qualitative research methodology. The findings of the research confirmed that, entrepreneur's lack of skills is a major contributor to the financing constraints of SMEs generally, especially for the use of participatory financing. The investment returns, which are inextricably link to firm success is also premised on the SME entrepreneur possessing the right competencies to sail the firm to the promised land i.e., success.

Bello et al (2015) studied the effect of entrepreneurial skills management and funding on small and medium enterprises performances at the local government level in Northern Nigeria. A questionnaire was used to collect the research data from 300 entrepreneurs. The study concluded that entrepreneurial skills accounted for over 40 percent of the variations in the firm's success. Thus, it is a strong factor for firm success, which is a cardinal considered factor for the use of risk-sharing financing, because returns on these instruments are pegged to the actual outcome or success of the firm.

Ahmad et al (2010) investigated whether entrepreneurial competency is the silver bullet for SME success in a developing nation. A critical analysis method was used to generate analyse the research data. The results of the study confirmed that entrepreneurial competencies are strong predictors of business success in SMEs. Hence, anything that supports or contributes to the firm's success is relevant for the decision making either to use participatory financing instruments or not.

Mitchelmore and Rowley (2010) conducted a literature review on entrepreneurial competencies and the development agenda. The review seeks to provide an integrated account of contributions relating to entrepreneurial competencies by different authors working in different countries and different industry sectors and at different points in time; and develop an

agenda for future research, and practice in relation to entrepreneurial competencies. The findings of the study indicated that entrepreneurial competencies have a strong relation and a positive impact on firm performance. Thus, financial management skills are a salient ingredient for use of risk-sharing financing instruments. Hence, considering the above empirical studies, this research hypothesises that:

**H3o:** The entrepreneurship skills of the SME entrepreneurs do not have a strong and positive relationship with the IFIs decision to use the Islamic participatory modes.

**H3i:** The entrepreneurship skills of the SME entrepreneur do have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes.

### **3.9.4 Knowledge Level of SME Entrepreneurs on IF Principles and Products**

Haruna et al (2024) examined the factors that determine the adoption of Islamic finance products in a non-Islamic country such as Cameroon. The research collected primary data from 1,358 SMEs from over eight regions in the country using a self-administered questionnaire. Findings of the study reveals that, desire to comply with the Islamic Law, awareness, attitude and intension were critical determinants for the decision to adopt Islamic finance products by SMEs in Cameroon.

Ezeh and Nkamnebe (2021) examined the predictors for the adoption of Islamic banking in Nigeria. Their research data was collected from 385 Islamic bank customers and findings indicate that knowledge has a positive and significant relationship with the intention to adopt the Islamic finance products.

Imran et al (2018) examined the linkage between knowledge processes and firm performance. Using a data set of 197 responses, the research concludes that the acquisition and application of knowledge have a direct positive impact on firm performance.

Mariadas and Murthy (2017) investigated the factors influencing the adoption of Islamic banking in Malaysia. From the data collected from 130 participants the study found that knowledge was an influential factor for the adoption of Islamic banking.

Sabirzyanov (2016) studied the Islamic financial products and services patronising behaviours in Tatarstan. From a sample of 517 respondents, results indicate that awareness i.e., knowledge has a positive effect on attitude and subjective norms which are critical antecedents for intention to patronise the Islamic finance products and services.

Thus, based on the above empirical studies, the research hypothesises that:

**H4<sub>0</sub>:** The knowledge level of SME entrepreneurs on the Islamic finance principles and products do not have strong and positive relationship with the IFI's decision to use the Islamic participatory modes.

**H4<sub>1</sub>:** The knowledge level of the SME entrepreneurs on the Islamic finance principles and products does have strong and positive relationship with the IFI's decision to use the Islamic participatory modes.

### **3.9.5 Willingness of SME Entrepreneurs to Use the Participatory Modes**

Seddiq et al (2024) attempt to predict the behaviour of Moroccan SME managers towards participatory financing, by looking at the potential factors that could influence the desire for adoption. The findings suggest that factors such as attitude, subjective norms, and perceived behavioural control significantly influence their intention to adopt participatory financing.

Al Balushi et al (2019) studied the Omani SME perceptions towards the Islamic financing system. Using data collected from 385 SMEs, the findings indicate that SMEs are willing to partner with Islamic banks in their business financing arrangements. Thus, saw participatory modes such as *Musharakah* in a positive light.

Rahman (2017) investigated the role of Islamic banks in enhancing SME's access to finance in Malaysia with a focus on *Musharakah* mode. The study results highlight the willingness by the SMEs to have their financing banks be involved in the operations of their businesses. The results indicate that the prospect of financial management advice from the bank could be one of the possible reasons for preferring such a mode of financing since poor financial management is a popular issue for SMEs.

Badaj and Radi (2017) empirically investigated the perception of Moroccan's SMEs towards the profit and loss-sharing financing. Using a sample size of 153 respondents, the findings of the research highlight that Moroccan SMEs consider PLS products as appropriate for their financing needs and this hints their willingness to use them.

Hussaini and Malami (2012) tested the acceptability of profit and loss sharing financing arrangements by the small-scale businesses in northern Nigeria. The findings of the research indicate that small-scale businesses desire to use the profit and loss sharing financing mechanisms.

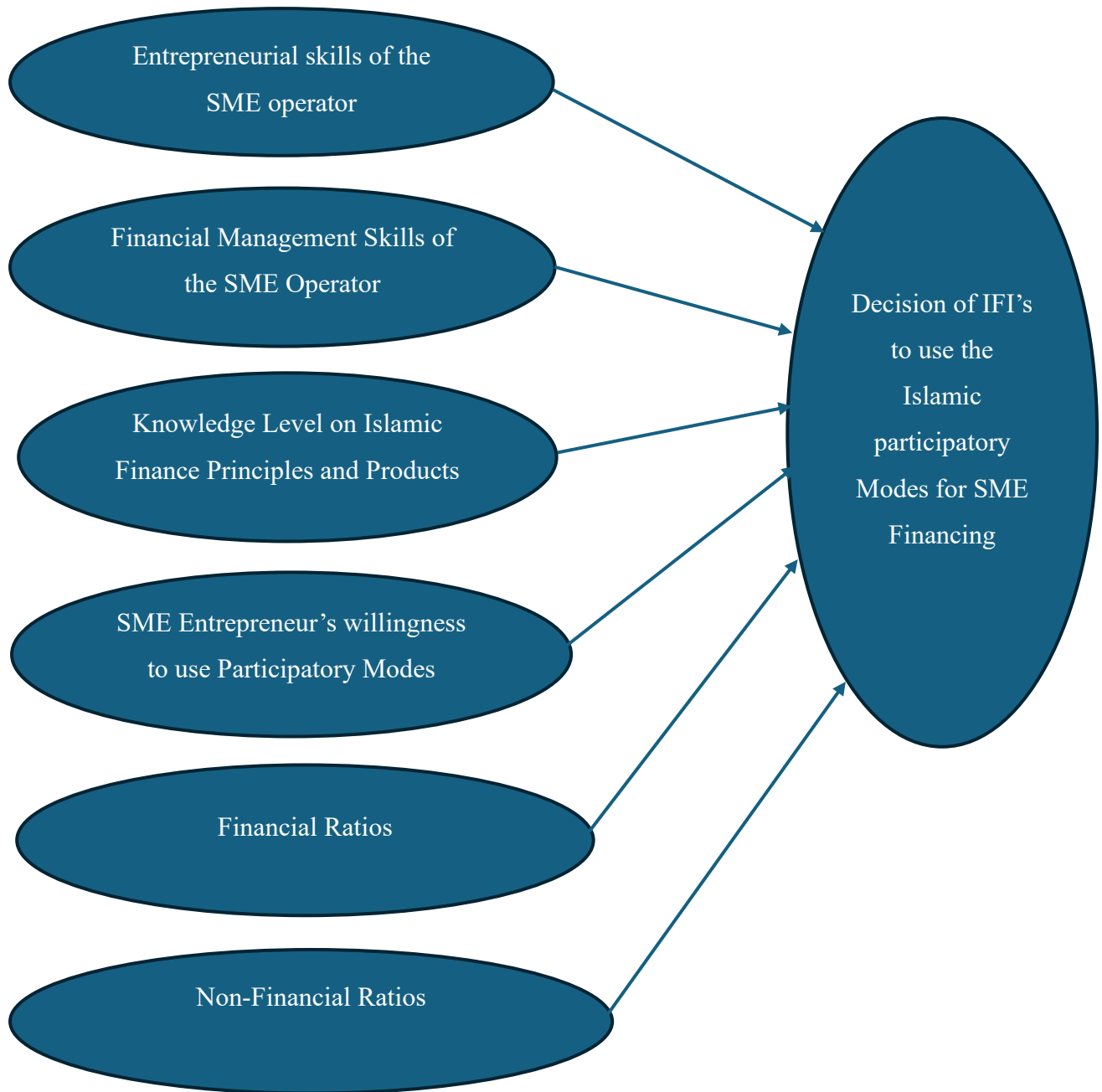
Jalaluddin and Metwally (1999) examined profit and loss sharing as alternative financing method for SMEs in Australia. The findings of their study from 385 respondents indicate that, over 59.6 per cent of the respondents are willing to use the PLS method of financing. The study highlights that, the preference for the PLS modes of financing is informed by risk-sharing feature, motivation for business expansions, cost of borrowing, suitability of PLS modes amongst others.

Hence, in the light of the preceding empirical studies, this research hypothesises that:

**H5<sub>0</sub>:** The willingness of SME operators to use to the Islamic participatory modes of financing does not have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes.

**H5<sub>1</sub>:** The willingness of the SME operators to use the Islamic participatory modes of financing do have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes.

**Figure 1: The Research Conceptual Framework**



### **3.10 Conclusion**

This chapter has laid the theoretical and empirical foundation necessary to investigate the factors influencing the use of Islamic participatory financing instruments for SMEs by IFIs. The chapter explores the relationship between Islam and entrepreneurship as well as the Islamic entrepreneurial financing modes. The suitability of the Islamic participatory modes of finance

for SMEs has been highlighted including the challenges of administering such financing modes. Consequently, the viability of psychometrics and data mining in addressing these challenges have been explored. The empirical review further validated six critical constructs, financial management skills, entrepreneurial skills, knowledge level, the willingness of SME entrepreneurs to use the Islamic participatory modes, financial ratios and non-financial ratios as decisive factors that can influence the adoption of Islamic participatory financing by IFIs in financing SMEs. The chapter provides a strong analytical basis for the subsequent empirical investigation, and thus, the next immediate chapters (4 and 5) will focus on the research context as well as the methodology employed to test these relationships and evaluate the practical feasibility of applying participatory financing models to the SME sector.

# CHAPTER 4

## THE RESEARCH CONTEXT

### 4.0 Introduction

In this chapter, we explore the context of the research to provide the reader an overview of the environment from which the research was conducted. This research uses The Gambia as a case and the chapter highlights briefly the geography, political, economic, and financial systems of the country. It concludes with a brief overview of SMEs in The Gambia and SME financing.

### 4.1 The Research Setting: A Snapshot of the Political, Economic and Financial Systems of The Gambia

The Gambia is the smallest country in mainland Africa, which stretches about 450 km inland along the river Gambia (IFAD, 2025). The population is estimated at 2.42 million, of which females account for 51 per cent and 49 per cent for males (GBoS, 2024). The country has a total land area of about 11,300 km<sup>2</sup>, and it is surrounded by the only neighbouring country, Senegal, on all three sides except on the Western side at the estuary of the River Gambia, where it spans 30 miles wide and 200 miles in length, running into the Atlantic Ocean (Perfect, 2008; Conteh and Hassan, 2021).

Figure 2 Map of The Gambia



Source: (<http://www.geo-ref.net/en/gmb.htm>)

The Gambia was accorded autonomous status by Britain in 1963 and became a full independent nation on the 18<sup>th</sup> of February 1965 (Open Doors International, 2024). The country has had a democratic parliamentary system of government since its independence and has been ruled by three successive heads of state and presidents since independence. At the onset, a one-time veterinary officer, Sir Dawda Kairaba Jawara became the country's first Prime Minister and

later President and reigned for over 30 years. On July 22<sup>nd</sup>, 1994, Lieutenant Yahya Jammeh and his team of army officers seized power and overthrew the democratically elected government of Sir Dawda Jawara. Lieutenant Jammeh transitioned from military leader to civilian president, and won all the subsequent presidential elections except in 2016, when seven political parties and one independent candidate coalesced and brought an end to the 22 year rule of Yahya Jammeh through the ballot box and ushered in a new coalition government under the Presidency of Adama Barrow (Open Doors International, 2024; Conteh and Hassan, 2021). Adama Barrow, after falling out with the main party in the original coalition, later formed his own political party, the National People's Party (NPP), under which he continues to serve as the current head of state.

#### **4.1.1 Economic and Financial Systems**

The Gambia has a liberal and market-based economy (IMF, 2020). The economy is heavily reliant on a rain-fed subsistence agricultural sector that provides the source of livelihood to more than 60 per cent of the population (Ceesay, 2023; Conteh and Hassan, 2021). The inherited economy from independence relied largely on a single agricultural commodity that is the groundnut Ceesay (2023) although tourism and remittances have also been making significant contributions over the years (IFAD, 2025). With over half of the population living in poverty IFAD (2025) women and young people account for the greatest chunk of the poor and extremely poor, who are mainly farmers and agricultural workers (Ceesay, 2023). On the recent economic fundamentals, the African Development Bank reports that The Gambia's economic activity held up well in 2023 with a growth in real GDP from 4.9 to 5.6 per cent, mainly supported by improvements in tourism, construction, and industry. The budget deficit narrowed from 4.9 percent of GDP to 3.5 per cent. Similarly, the public debt-to-GDP ratio improved significantly, declining from 82.8 per cent to 71.8 per cent of GDP.

The Gambia so far, has no popular natural resources like gold, silver, iron, oil etc., or major domestic factories for production, and thus, significantly relies on international trade to keep the economy afloat. This makes the Gambian economy vulnerable to international shocks, as volatility in commodity prices has adverse effects on the economy (Conteh and Hassan, 2021). Over the years, agricultural production has been affected by limited rainfall, while international shocks impact on inflation in the country, tourism has also experienced a slowdown, causing the country to experience alternate periods of buoyancy, stagnation, and decline (Ceesay, 2023). Over time, this cyclicity of the economy has compelled many of the already poor citizenry to turn to SMEs for survival, hence, the country has seen a surge in the number of small and

medium enterprises, meant to create jobs and raise household incomes. However, despite the prominent roles of SMEs in creating jobs and raising incomes especially for the vulnerable groups like women and youth, they continue to experience difficulties in accessing the much-needed finance.

On the regulatory and supervisory front, the Central Bank of The Gambia (CBG) derives its mandate from the 1997 Constitution of the Republic of The Gambia and the Central Bank of The Gambia Act, amended in 2018 (CBG, 2025). The Banking Supervision Department of the Central Bank of The Gambia is responsible for licensing, regulating, and supervising the banking sector, pursuant to Section 71 of the Central Bank Act, 2018, to maintain public confidence in the safety and soundness of the financial system. The core mandate of the department is to protect users of these systems (CBG, 2025). The Banking Act of 2009 and the NBFi Act of 2016, empower the Central Bank of The Gambia to regulate and supervise the activities of the commercial banks including Islamic banks, insurance, and takaful companies, microfinance institutions including Islamic microfinance institutions as well as capital market operations in The Gambia (Guideline for IFIs, 2022; NBFi Act CBG, 2016).

Meanwhile, the guideline for the regulation and supervision of Islamic Finance Institutions in The Gambia, provides the supervisory framework for Islamic finance operations (Guideline for IFIs, 2022). The history of Islamic banking in The Gambia could be traced back to the incorporation of the only Islamic bank in the country ‘Agib bank’ in November 1994 (Conteh and Hassan, 2021). The current Islamic finance ecosystem in The Gambia comprises of one fully-fledge commercial bank, four takaful operators, two Islamic micro finance institutions, one Islamic window of a commercial bank, and one Islamic window of a credit union.

The financial sector is reported to be resilient, with a reduction in non-performing loans from 4.6 per cent to 3.5 per cent, while the capital adequacy ratio of 24.6 per cent exceeds the regulatory requirements of 10 per cent. However, inflation is reported to have accelerated, permeating the cost-of-living crisis, eroding household income, and increasing poverty from 45.8 per cent to 53.4 per cent. A 9.9 per cent depreciation of the exchange rate is reported, while the current account deficit deteriorated from 6.1 per cent to 7.6 per cent, permeated by weak agricultural exports and rising commodity import prices. Likewise, international reserves declined from 5.3 months of import cover to 4.4 months, while overall unemployment was estimated at 31.6 per cent (AfDB Group, 2024).

**Table 4.1 Composition of the Financial System**

	<b>No. of Institution</b>	<b>Assets (in Millions of GMD</b>	<b>Industry share</b>
Commercial Banks	12	100,326.66	88.4
Insurance Companies	15	1,168.00	1.0
Micro Finance (FCs & CUs)	56	8531.86	7.5
Financial Technology (MM & Fintech)	13	2987.46	2.6
Forex Bureau	115	441	0.4
<b>Total</b>	<b>211</b>	<b>113,454.98</b>	<b>100</b>

**Source:** CBG Annual Report 2024

The Gambia's financial system is generally shallow and underdeveloped with no capital market (IMF, 2024). The financial system is composed of banks, deposit-taking non-bank financial institutions, insurance companies, and pension funds, with the Central Bank acting as the primary regulatory authority (CBG, 2024). The commercial banks dominate the financial system with a total of twelve, of which one is an Islamic bank. Although all banks are domestically incorporated, eight of them are foreign subsidiaries of mainly Nigerian origin banks (IMF, 2024; Conteh and Hassan, 2021).

**Table 4.2 Consolidated Assets of Commercial banks**

	2021		2022		2023		2024	
	Level	% change	Level	% change	Level	% Change	Level	% Change
Cash-in-hand	3,539	-16.5	3,598	1.7	3,049	-15.3	4,793	57.2
Balances due from other banks	20,814	29.6	18,475	-11.2	21,891	18.5	23,079	5.4
Investments	25,234	10.9	26,436	4.8	27,251	3.1	35,387	29.9
Bills purchased & discounted	57	39	12	-78.9	12	0	14	16.6
Loans and advances	9,045	27.3	13,979	54.5	16,529	18.2	18,035	9.1
Fixed assets	2,532	17.5	2,651	4.7	2,933	10.6	3,584	22.2
Acceptance endorsement & guarantees	8,702	47.9	11,739	34.9	12,764	8.7	12,174	-4.6
Other assets	2,057	36.4	1,675	-18.6	2,031	21.3	3,261	<b>60.6</b>
<b>Total assets</b>	<b>73,058</b>	<b>24.2</b>	<b>78,572</b>	<b>7.5</b>	<b>86,516</b>	<b>10.1</b>	<b>100,327</b>	<b>16</b>

Source: CBG Annual Report 2024

The twelve banks operate through approximately 94 branches countrywide, with over 133 ATM locations mainly found in the urban areas, and account for over 88.4 per cent of the industry's assets. This is followed by the deposit-taking non-bank financial institutions including finance companies and credit unions which account for 7.5 per cent. The insurance industry makes up 1.0 per cent. Mobile Money and Fintech make up 2.6 per cent and Forex Bureau constitute 0.4 percent (CBG, 2024). The twelve operating commercial banks are categorised into larger, medium, and small based on their asset size. The one large bank hold 23.9 per cent of the industry's total assets, while two medium bank represents 31.3 per cent. The remaining nine small banks make up 44.8 per cent of the industry's total assets (CBG, 2024). With no capital market currently, the customer deposits remain to be the primary source of funding for the Gambian commercial banks, accounting for 65.2 per cent of the total liabilities.

The distribution of commercial bank credit is heavily skewed towards a few sectors and industries. The distributive trade and manufacturing account for the greatest chunk with over 13.5 per cent of total outstanding credit each. This is followed by construction, agriculture,

personal loan, energy, transportation, financial institutions, and tourism account for 10.4, 8.9, 7.9, 5.6, 3.5, 2.9, 6.0 2.9 and 1.7 respectively, while other unclassified account for 31.9 per cent. The manufacturing industry in The Gambia, though still small and dominated by small-scale production, saw significant credit growth. The sector experienced a marked increase in credit allocated to it, driven by a rise in start-ups and small and medium-sized businesses (CBG, 2024).

#### **4.1.2 Islamic Finance Development in The Gambia**

The history of Islamic finance in The Gambia dates to the incorporation of Arab Gambian Islamic Bank (AGIB) in November 1994, as the nation's first and till date the only Islamic bank (CBG, 2024). The bank provides both retail and corporate banking services, including savings and investment accounts, trade finance, foreign exchange services, and Islamic financing instruments. Over the years, AGIB has undergone significant ownership changes, including a strategic alliance with a Nigerian bank in 2008 and a subsequent acquisition by a Gambian investor in 2014 (Conteh and Hassan, 2021). The Islamic finance industry in The Gambia has over the years experienced a gradual but constrained development, shaped by institutional, regulatory, and structural factors. The Islamic finance ecosystem in The Gambia remains underdeveloped and consists of one Islamic bank, four takaful operators, and about two Islamic microfinance institutions (CBG, 2024). Despite the country's predominant Muslim population, which theoretically provides a strong demand base for Shariah-compliant financial services, the Islamic finance sector remains relatively small and continues to operate alongside a dominant conventional system.

The regulatory framework for Islamic finance in The Gambia is evolving but remains underdeveloped. The Financial Institutions Act (2003), later amended into the Banking Act (2009) has been amended as the first regulatory step to cater to the provision of Islamic finance services without a standalone regulatory framework specifically dedicated to Islamic finance. Part III, Sections 12 to 17 of the Banking Act 2009, deal with the regulation and supervision of Islamic banks. Similarly, the Insurance Amendment Act 2006 caters for the licenses, regulation and supervision of Takaful operation and the Non-Bank Financial Institution Act 2016 caters for the regulation and supervision of Islamic microfinance institutions. The biggest regulatory success so far, for the Islamic finance industry is the issuance of the guidelines for the regulation and supervision of Islamic Finance Institutions in 2022 which came into effect in 2023 covering key areas like Shariah governance, financial reporting, product development etc (Guideline for IFIs, 2022). In the absence of these, the Islamic financial institutions in The

Gambia operate largely within the conventional regulatory structures, with limited adjustments to accommodate Shariah-compliant operations. While this approach has facilitated the initial establishment of Islamic finance in country, it also creates regulatory ambiguities and inconsistencies amidst lack of dedicated regulatory framework. Overall, the regulatory environment, while supportive in principle, remains insufficient to drive robust growth in the Islamic finance sector. Hence, the development of the Islamic finance industry in The Gambia must therefore be understood within the broader context of an underdeveloped financial system, limited institutional capacity, and evolving regulatory frameworks.

Furthermore, a core principle of Islamic finance is the use of participatory modes of financing such as *Mudarabah* and *Musharakah*, which promote risk-sharing and equitable distribution of returns (Chapra, 2000). These instruments are particularly relevant for supporting entrepreneurship and small and medium-sized enterprises. However, their use in The Gambia just like everywhere else across the global industry, is very minimal due to the higher risks associated with them including information asymmetry, moral hazard, and weak contract enforcement mechanisms (Ahmad, 1994; Qorchi, 2005). Country level constraints further limit their use in The Gambia including, underdeveloped financial system with no capital, absence of dedicated regulatory tools, shortage of skilled professionals in Islamic Finance, and the nascent stage of its development amongst others, all of which together reduce the feasibility of implementing participatory financing in the country especially for SMEs. These systemic constraints fundamentally shape both the supply of and demand for Islamic financial services. Consequently, while participatory instruments exist in principle, their effective non-availability in practice limits the developmental role of Islamic finance in The Gambia, particularly in supporting SMEs. Thus, for Islamic finance to play a more significant transformative role, reforms are needed to strengthen regulatory frameworks, enhance institutional capacity, and promote the adoption of genuine risk-sharing instruments such as *Mudarabah* and *Musharakah* for SMEs.

#### **4.1.3 Gambian SMEs and SME financing**

The absence of a universally accepted definition of SMEs has prompted countries and international organisations across the World to contextualise their definition of SMEs. In fact, Balkenhol et al (2013) argued that one of the greatest constraints faced by SME entrepreneurs is the absence of a recognised official definition of an SME at the global level. The Gambia is by no means an exception. In The Gambian context, the official SME definition is provided

by The Gambian National Policy for Micro, Small and Medium Enterprises ‘ (MSMEs, 2019-2024).

**Table 4.3 Characteristics of MSMEs at each level**

<b>MSME Category</b>	<b>Employees (Number)</b>	<b>Paid in capital/assets GMD</b>	<b>Annual Sales GMD</b>
Micro	1 to 4	0 – 25,000.00	0 – 100,000.00
Small	5 to 49	25,000.00- 1 million	100,001-1 million
Medium	50 to 99	1 million – 5 million	1 million – 10 million
Large	100 or more	More than 10 million	More than 10 million

Source: (MSME policy 2019-2024)

The above categorisation of SMEs in The Gambia seeks to define SMEs along criteria such as number of employees, asset size, and annual sales or turnover. As Jallow (2023) reported citing Hussein Kakembo et al (2021) defining SMEs along these criteria is a dominant trend reported in literature. Thus, The Gambian definition encapsulates popular criteria used in defining SMEs. The SME sector in The Gambia is less formal, with a large chunk of them operating in sectors like trading, services and agriculture (Jallow, 2019). The results of the MSMEs mapping exercise conducted in 2018 indicate that, there are about 115, 068 SMEs in The Gambia, 98 per cent of which operate as sole proprietors, of which only 21 per cent is registered, leaving vast majority as unregistered. Meanwhile, only 16 per cent of The Gambian SMEs are registered with the Gambia Revenue Authority (MSMEs, 2019-2024; MoTIE, 2020). This shows that majority of the Gambian SMEs remain in the informal sector. In fact, The Gambia labour force survey conducted in 2025 showed that, over 81 per cent of the national employment is under informal employment (GLFS, 2025). Despite this huge informality, their economic role remains unshakably paramount. As (Jallow, 2019) and more recent (Jabanj and Basso, 2024), all attributed over 60 per cent of the labour force to SMEs. The Gambian SMEs dominate the private sector covering, trade, agriculture, services, tourism and small-scale manufacturing, while over 70 per cent of them are self-employed and informal as reported by the national entrepreneurship policy (MOTIE, 2017).

There is a broad consensus that SMEs are the major drivers of global economies due to their unmatched role in employment creation, supporting innovations, wealth creation through new

ventures and contribution to national, regional, and global GDPs. As indicated earlier, the World Bank estimates that global SMEs account for about 70 per cent of the formal labour force, contribute about 50 per cent of the global GDP and constitute over 90 per cent of all formal business establishments (World Bank, 2022). The European Union estimated that, of its 23 million SMEs, 99.8 per cent represent small firms in the non-financial services businesses and provide over two-third of all jobs (European Investment Bank Group, 2022). Similarly on the African continent, specifically in the Sub-Saharan African, there are approximately 44 million SMEs providing over 80 per cent of all jobs (APET secretariat, 2022). Just like many other countries, Gambian SMEs play a prominent role in economic growth and development of the country. Despite their unmatched economic and developmental roles, global SMEs remain to be the most constrained business category in terms of access to finance (World Bank., 2017).

A suit financing channels are available to Gambian SMEs despite the monumental financing gap in addressing their funding needs. The channels may be categorised into government linked programs, NGO-funded programs, commercial sources as well as informal or community-based funding (Jabanj and Basso, 2024). For instance, the Empretec-Gambia project, Youth Empowerment Project (YEP), the National Enterprise Development Initiative (NEDI), GIEPA' Development Fund are all government-linked projects aim at supporting SMEs with requisite capacity development and the provision of seed funding. Again, NGOs and International agencies like UNCDF, UNDP, ITC etc, are also very involved in helping Gambian SMEs with capacity-building and in some cases provide funding especially to the social enterprises. The commercial sources of funding are primarily banks and microfinance institutions which together provide a proportionate amount of SME funding. The absence of sophisticated channels like, private equity and venture capital in the country, make the informal sources like rotational savings and credit associations (RISCAS), friend and families etc a popular source for Gambian SMEs (Jabanj and Basso, 2024).

Informal financing in The Gambia is not merely a supplementary funding source but a foundational pillar of SME survival and operation, particularly within the country's highly informal economic structure. One of the most prominent mechanisms is the rotational savings and credit association (ROSCA), locally known as *Osusu*. In this system, a group of individuals contributes a fixed amount of money at regular intervals, and the total pooled sum is allocated to one member on a rotating basis. This arrangement enables participants to access lump sums of capital without engaging with formal financial institutions (Jabanj and Basso, 2024; Steel

and Andah, 2003). The widespread reliance on such systems is largely driven by structural barriers within the formal financial sector. Informal financing mechanisms are embedded in social relationships and community trust, making them more accessible, quicker to obtain, and flexible in repayment terms. This relational nature reduces transaction costs and eliminates the need for formal documentation, which many small business owners may lack (Aryeetey, 2008). Additionally, informal finance aligns closely with the socio-cultural context of The Gambia, where communal support systems and extended family networks play a significant economic role. Entrepreneurs often rely on family members, friends, and local networks not only for financial capital but also for advice, labour, and market connections. This generates a form of social capital that substitutes for the financial capital typically required by formal institutions (Putnam, 1993; Woolcock, 1998). Consequently, informal finance contributes significantly to financial inclusion, particularly for women, youth, and rural entrepreneurs who are disproportionately excluded from formal banking systems (Demirgüç-Kunt et al, 2020). The overriding implication of the heavy dependence on informal finance may inadvertently reinforce informality itself for Gambia SMEs. Since these financial arrangements operate outside formal regulatory frameworks, SMEs that rely on them may have less incentive to formalise their businesses. This perpetuates a cycle in which firms remain excluded from formal credit markets, government support programmes, and broader economic opportunities (La Porta and Shleifer, 2014).

## **4.2 Conclusion**

In this chapter, we look at the environment in which the study was conducted. The Muslim majority population, increasing adoption of mobile technology and digital platforms, as well as growing demand for Islamic finance products, especially by the SME sector in the Gambia, make the country a perfect environment to explore how Islamic finance innovations can address the financing needs of underserved enterprises such as SMEs. The chapter presents briefly the location, political, economic and financial systems of the country and concludes with a snapshot of Gambian SMEs and SME financing.

## CHAPTER 5

### RESEARCH METHODOLOGY

#### 5.0 Introduction

In this chapter, the researcher informs the reader about the techniques and the instrument used to collect and analyse the research data. It delineates the overall methodology employed in the research and outlines precisely major methodological components like research design, method of data collection, sampling design, research instrument, data processing and analysis amongst others. Each of the components of the chapter is discussed in detail below.

#### 5.1 The Research Philosophy

A research philosophy which also called paradigm or philosophical position, is the basic set of beliefs that guide the design and execution of a research study (Tamminen and Poucher, 2020). Research according to Khatri (2020) is an organised and systematic approach of inquiry on a specific phenomenon, and it thus refers to the process through which the researcher accomplishes answers to research questions. Research is usually conducted to either solve a problem, discover new knowledge or provide additional justification and better understanding on a specific issue Abu-Alhajja (2019). Successful research requires using appropriate approach as a necessary condition for providing convincing research findings. To this end, Creswell (2014) posits that research approach consists of three critical elements, including research philosophy, design, and methodology. All research studies are underpinned by different philosophical positions that carry different assumptions about the nature of reality and knowledge (Tamminen and Poucher, 2020).

The research philosophy primarily comprises four main elements i.e., ontology, epistemology, methodology and axiology (Mertens, 2010). Ontology is a branch of philosophy that deals with the nature of reality or existence. It examines the underlying belief system of the researcher about the nature of being or existence. On the other hand, epistemology deals with the assumptions that an individual holds about the nature of knowledge and how knowledge is produced (Tamminen and Poucher, 2020). While methodology deals with the appropriate approach to the systematic inquiry, and axiology which deals with the applications of ethics to the research study (Khatri, 2020). According to Holden and Lynch (2004), the methodological choice of the research should be related to philosophical position of the research and the

analysed social science phenomenon (Žukauskas et al, 2018). Furthermore, the literature on scientific research paradigm claims that the researcher must have a clear vision of a paradigm or worldview which provides the researcher with philosophical, theoretical, instrumental and methodological foundations to conduct research (Žukauskas et al, 2018).

Generally, research philosophy can be discussed in terms of ontology and epistemology (Ahmad, 2019). Various research philosophies have been discussed in literature, and according to Creswell (2014) and Mertens (2019) there are four research paradigms, including post-positivism or positivism, constructivism, transformative, and pragmatism. Meanwhile, Petty et al (2012) have condensed research philosophies or paradigms into two main categories i.e., positivism (post-positivism) and constructionism (interpretivism). The positivist research philosophy claims that social world can be understood objectively. The ontological assumption of the positive research philosophy is realism, which assumes that there is a single external reality that can be identified, measured and studied. Post-positivism is born out of positivist philosophical position. As science progressed, the ontological assumption of post-positivism has transitioned into a modified position called critical realism, which assumes that although there is one single universal reality or ‘truth’ that exists independent of the individual or researcher, however, it may not be apprehended fully owing to unknown variables within nature and the uncertainty in measurement (Lincoln et al, 2011). Post-positivist researchers may try to establish the quality of their research by using terms and techniques such as generalisability, validity, reliability etc.

Constructivism and constructionism are two research philosophies that share similar philosophical assumptions in that, they both take on a relativist ontological standpoint and a subjectivist and transactional approach as their underlying epistemological assumptions. A relativist ontological position assumes that there is no single external reality that is independent of the individual, rather, reality is understood as existing in the form of multiple individual mental constructions of the world that are shaped through lived experiences (Lincoln et al, 2011). A subjective and transactional epistemology posits that we cannot remove ourselves from what we know (Tamminen and Poucher, 2020). Both constructivism and constructionism accept that knowledge is created from social interactions and passed along within the social context, where knowledge is neither timeless nor universal (Jones et al, 2014). Hence, the task of the researcher under these philosophies is therefore, to acknowledge that researchers cannot enter a study as a ‘blank slate’ by separating themselves from their previous experiences and their interpretations of those experiences (Lincoln et al, 2011).

From an ontological perspective, this research adopts a critical realist position. In practical terms, this means that constructs such as entrepreneurial skills, knowledge, and trustworthiness are treated as real phenomena that exist independently of the researcher (Lincoln et al., 2011). These constructs are therefore operationalised into measurable indicators through structured questionnaire items which provide a sufficiently accurate approximation of underlying attributes. Meanwhile, the Islamic ontology emphasises spiritual, ethical, and metaphysical dimensions of reality that are not fully captured by purely empirical measurement. Thus, this creates a potential tension between the researcher's critical realist stance and participants lived realities. To address this, the research instrument was framed in ways that resonate with local values and belief systems, while the interpretation of the findings and the measured variables are influenced by deeper normative and religious factors that are not directly quantified (Jones et al., 2014). Epistemologically, the study follows a post-positivist position, where knowledge is generated through empirical observation and statistical analysis (Creswell, 2014). This is reflected in the use of standardised data collection instruments, quantitative techniques, and hypothesis testing to examine relationships between variables. The study formulates hypotheses based on existing theory, collects quantifiable data, and applies statistical methods to test relationships between independent and dependent variables. This reflects a deductive approach consistent with post-positivist assumptions, where theory is subjected to empirical verification. This reflective stance strengthens the philosophical coherence of the research by explicitly linking abstract assumptions to methodological choices and real-world conditions (Žukauskas et al., 2018). Therefore, the philosophical position of this research is not applied in a rigid or purely abstract manner. Instead, it is translated into practical research decisions: the selection of variables, the design of measurement instruments, the use of statistical analysis, and the contextual interpretation of results. This alignment ensures that ontology and epistemology are not merely theoretical constructs but actively shape how reality is defined, how knowledge is generated, and how findings are understood within the specific socio-cultural context such as that of The Gambia.

The study uses questionnaires to collect research data and apply statistical methods and techniques to validate the research data and to establish the relationship between the dependent variable and the independent variables. The results are interpreted within the broader framework of known realities about the research variables i.e., knowledge of level, skillset, trustworthiness etc. Thus, this research is situated within the post-positivism research philosophy based on the critical realism ontology.

## 5.2 Research Design

A research design could be defined as a strategy or a plan formulated to assist the researcher to answer the research questions (Conteh, 2020; Saunders et al, 2019). It reflects the research activities and procedures employed to achieve specific objectives (Easterby-Smith et al, 2015). It has also been defined as the road map for a specific research investigation in its attempt to answer the research questions Cooper and Schindler (2008) or a procedure of inquiry (Creswell, 2014). Thus, a research design is a comprehensive plan of how the research questions will be answered. It provides the framework for the collection and analysis of the research data Ghauri et al (2010) and guides the implementation of the research method (Bryman, 2001). In summary, a research design is a plan that describes how, when and where the research data are to be collected and analysed (Parahoo, 1997). A review of the extant literature proffers that, research design and research strategy are sometimes used interchangeably to refer to the plan to answer the research questions. There are several research designs known in the extant literature. However, four primary research designs or strategies are mainly used in social science research, and they include survey, case study, experimental and exploratory. Other researchers such as Saunders et al (2009) categorised research designs into, explanatory, exploratory, hypothesis testing and descriptive.

Selecting an appropriate research design is crucial in achieving the stated objectives of any study. In the literature, various research designs are used in the social science research including survey, case study, experimental and exploratory. These research designs are not mutually exclusive, and no single design is superior to the others. Thus, the appropriate research design to use in any research, very much depends on the research philosophy and the research questions that the researcher seeks to provide answers to as well as the research objective(s). This research utilises both the case study and survey research designs, as this combination is deemed appropriate to handle the research questions at hand and adequately support the achievement of the research objectives. A case study as a research design has been defined by Yin (2009) as ‘an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context especially when the phenomenon and context are not clearly evident’. On the other hand, a survey research design seeks to gather data from many subjects, units, organisations etc. collected via methods such as mail, questionnaire, telephone interviews, published documents etc., and the data is analysed using statistical techniques (Gable,1994). It has also been defined as an information gathering tool to quantitatively measure the attributes of a sample (Groves et al, 2009).

The primary objective of this research is to evaluate the potential value of psychometrics and data mining in promoting the use of Islamic participatory instruments to finance SMEs. The selection of the case study research design is justified by the fact that, the research looks specifically at the Islamic finance institutions in The Gambia and as well as The Gambian definition and understanding of what constitutes an SME (Small and Medium Enterprises). While the survey research design will allow cross-sectional data to be collected from SME clients of the participating institutions. Thus, this research utilises a mixed research design dubbed ‘case study-cum-survey research design’ as the researcher considers this combination as the best design to achieve the overriding research objective and adequately answer the research questions.

### **5.3 The Research Method**

It is common to confuse research method and research methodology. However, Miller and Dingwall (1997) highlight that the two terms are quite different. Quite simply, a research method is a tool for the collection and analysis of the research data (Strauss and Juliet, 1998). While research methodology on the other hand, is the overall framework upon which the research is conducted. It defines the specific procedures needed in the attempt to create or search for new knowledge. Thus, research methods are a part of research methodology. Once an appropriate research design or strategy has been decided by the researcher, the next pertinent step in the research methodology is for the researcher to determine how the research data will be collected and analysed.

A research method is fundamentally composed of three elements or stages including forms of data collection, data analysis and the interpretation of the research results (Abutabenjeh, 2018). The popular techniques or methods in collecting research data include structured interviews, questionnaires, direct participants observation etc., (Bryman, 2001). Furthermore, the research method reflects the research methodology adopted for the research i.e. whether qualitative or quantitative or a combination of both. A quantitative research method involves the collection of research data from a large study sample and the use of statistical techniques to analyse the research data. Furthermore, a quantitative method is objective, valid, reliable and controlled (Punch, 2005). This method is more effective in dealing with large number of data samples. In the qualitative method on the other hand, the researcher focuses on a smaller sample size and develops in-depth and richer research data, usually to gain insight into things such as feelings, opinions, impressions etc., that are not quantifiable or unobtainable by statistical means

(Myers, 2000). The qualitative method can be highly subjective, and the results of this method are open to the possibility of more than one valid explanation (Padgett, 2008).

In this research, the population for data collection is the SME clients of the Islamic finance institutions and institutions providing Islamic financing products in The Gambia. These institutions and clients are spread across the length and breadth of the country. Meanwhile, a questionnaire is the most appropriate and productive tool whenever a researcher wishes to reach many respondents (Conteh, 2020). Hence, a self-administered questionnaire and statistical techniques are found to be the ideal research method to employ for this study. For feasibility, including the constraints of time, financial and other resources, this choice of method for the research is considered second to none.

#### **5.4 The Research Data Collection**

The combination of case study and survey research designs allows this study to utilise several data collection methods. The integration of psychometrics and data mining into the screening mechanism of IFIs for the use of Islamic participatory modes of financing necessitates the use of both quantitative and qualitative data collection techniques (Creswell and Clark, 2017). A major part of the primary data for the research was collected from the target population via a questionnaire administered to the subjects through Google Form. A questionnaire may be defined as a standardised form of interview in which pre-determined questions are administered, and the answers are recorded in a standard format mainly pre-coded (de Vaus, 2014). The questionnaire for this research was designed to cover both the normal sociodemographic information of the SME entrepreneurs, firm-specific information, as well as questions on the specific research variables.

To begin the data collection process, the researcher had a few meetings with the management and credit administration staff of the four participating institutions to explain the scope, role and expectations of the institutions and their participating SME clients. After establishing common understanding with the officials of the institutions, the researcher, after receiving the data from the institutions, began to engage the participating SME clients through business premises visitations and phone calls, to explain the aim of the research and their role in completing the research questionnaire. The researcher spoke with them in English or any of the local languages found appropriate. On average, the researcher spent fifteen to twenty minutes with each SME client, explaining the research and the questionnaire and afterwards shared the questionnaire link either through email or WhatsApp. The literate SME clients were allowed

to complete the questionnaire by themselves and could seek clarification from the researcher if the need arose. The researcher travelled across the length and breadth of the country to assist the illiterate clients to complete the questionnaire. However, some of the literate clients will request researchers to meet them at their business premises to make physical acquaintance.

Because a large portion of the SME clients in The Gambia are illiterates, more than half of the total responses were completed with the help of the researcher meeting the respondents at their business premises or any suitable locations. For the SME clients who are spread across far and wide in the provincial locations of the country, the researcher had decided to meet them in groups at the closest branches of the participating institutions and attend to them one-on-one within the premises of the branch. The secondary data of the research was collected through annual reports of the participating institutions, government official reports and other publicly and privately relevant documents, including the policies of the participating institutions.

## 5.5 Sampling Design

### 5.5.1 The Research Population

The population of research is the entire group of subjects or units from which the required research data is drawn (Creswell and Creswell, 2018). When the researcher collects data from the entire population, this is commonly known as a census. However, it is impractical for any researcher to collect data from the entire population due to time, costs and other factors. Thus, the researcher collects data from a sample that is representative of the population specified. The subjects or units should meet the required criteria set by the researcher for inclusion in the research sample frame or target population (Burns, 2003). In this research, two sets of samples were used i.e., sample to institutions and sample of clients and the criteria for inclusion in the research population include for institutions include.

- i. Be an Islamic finance institution or service provider.
- ii. Providing financing to SMEs.

**Table 5.1 The Population of SME Clients**

Name of Institution	APS Islamic Microfinance	Yonna Islamic Microfinance	Salaam Fin Services	GTU- ICCU	Total
No. of SME Clients	430	90	177	94	791

In this research, four financial institutions participated including three microfinance institutions and an Islamic window of the only Teacher’s Credit Union of The Gambia. The total population of the research was 791 Gambian SMEs drawn from these four institutions. The population of the research includes the SME clients of these institutions that have received financing in the last three years. The use of three years cut-off period was informed by the fact that two of the institutions (APS and Yonna) have been in operations just about three years, thus they cannot provide data beyond this.

### 5.5.2 Sampling Frame

A sampling frame is a list of all the elements in the population from which the sample is drawn (Creswell and Creswell, 2018). It is thus, the part of the population which is selected for investigation (Bryman, 2008). It provides the working or operational population for the research field work. In this research, the sample frame comprises of SME clients of Islamic finance institutions and the institutions that provide Islamic financing products. These stated criteria allowed four institutions including three microfinance institution and an Islamic window of a credit union to be included. Similarly, the researcher sets the criteria below for subjects (SME clients) to qualify for inclusion in the research.

- i. Be an SME client of any of the four participating institutions.
- ii. Received financing in the last three years i.e., (2022-2024).
- iii. Received GMD 100, 000.00 and above.

The cut-off financing amount of GMD 100, 000.00 is arbitrary by the researcher. Considering the efforts and costs associated with the Islamic participatory modes of financing, the researcher believes that any amount below this will not merit for the institutions to opt for such modes of financing.

**Table 5.2 The Sampling Frame of SME Clients**

Name of Institution	APS Islamic Microfinance	Yonna Islamic Microfinance	Salaam Fin Services	GTU- ICCU	Total
No of SME Clients	97	59	101	72	329

Based on the criteria specified above, the sample frame of this research consists of 329 SME clients drawn from the four institutions.

### **5.5.3 Sampling Size**

A sample size refers to the number of respondents or units from whom data will be collected (Saunders et al, 2019). It has also been defined as the number of participants or observations included in a study (Creswell and Creswell, 2018). There is no hard and fast rule on the sampling size for research, and it varies from one research to another. However, Sekaran (2003) contends that, the most ideal sample size for research should be above 30 subjects or units and less than 500 subjects or units. For any meaningful statistical analysis to be done, Saunders et al (2012), considers a sample size of 150 units as enough. Generally, the larger the sample size, the more likely that the results will be an accurate reflection of the population hence a greater room for the generalisations of the research findings (Saunders et al, 2009). In this study, the research population comprised of 791 SMEs drawn from the four institutions that fulfilled the requirements for inclusion in the research population. Similarly, out of these 791 SMEs, a sample frame comprising of 329 SMEs was selected to be representative of the research population for the collection of the actual research data. According to Saunders et al, (2019) an acceptable sample size is one that balances statistical requirements with practical constraints and is large enough to be representative of the population. For quantitative studies they argue, a sample size of 30 or more is often considered sufficient for statistical analysis. The sample frame for this research represents over 41.5 per cent of the study population which is without a doubt an excellent sample size for the research.

### **5.5.4 Sampling Method**

Generally, there are two main types of sampling methods that are utilised in quantitative research, and they include probability sampling and non-probability sample which is also sometime referred to as convenience sampling. In a non-probability or convenience sampling, the selection of subjects or participants for the research is not premised on objectivity or getting a statistically representative sample but rather it is based on the subjective expert judgement or personal experience of the researcher. Welman and Kruger (2001) argue that convenient sampling method is the most appropriate for a study that is in an exploratory stage when ideas and insights are more significant than scientific objectivity. This research on the role of psychometric and data mining in promoting the use of Islamic participatory modes of financing for SMEs is very much new and at exploratory stage, hence convenient sampling is the most ideal method to adopt for the research. A key tenet of psychometrics assessment is the ability to generalise the result, and the generalisation of the research findings is possible when the

sample is presentative of the population of interest (Sarira et al, 2020). Meanwhile, Ahmad (2017) submits that the results of a convenient sampling can be generalised if the sample size is large.

This research thus adopted a non-probability or convenient sample method as not all the subjects in the population had equal chance of selection for the research. As indicated, the researcher devised criteria for inclusion in the sample frame, and this includes being financed at least GMD100, 000.00 and above, receiving the financing within the last three years etc. These conditions necessarily exclude some subjects from the sampling frame. The researcher believes that due to the costs and difficulties in administering the Islamic participatory modes of financing, smaller financing amounts will not merit the Islamic finance institutions to use them in financing SMEs.

### 5.5.5 Sampling Element

A sampling element has been defined by Babbie (2020) as a unit of which a population is composed, and which is selected in a sample. It is the main line of enquiry, unit of analysis or the case being investigated in research. In this research, small and medium enterprises commonly referred to as SMEs are the research sampling elements, as the researcher seeks to explore the role of psychometric analysis and data mining in promoting the use of the Islamic participatory modes of financing for SMEs. Cognizant of the divergent definitions of SMEs across different jurisdictions, industry and international organisations, this study’s sampling elements adopts The Gambian definition and understanding of SMEs as provided by The Gambian National Policy for ‘‘Micro, Small and Medium Enterprises’’ 2019-2024. This policy defines MSMEs using popular criteria such as the number of employees, annual turnover, assets or capital paid.

**Table 5.3 Characteristics of MSMEs at each level**

<b>MSME Category</b>	<b>Number of Employees</b>	<b>Paid in capital/assets GMD</b>	<b>Annual Sales GMD</b>
Micro	1 to 4	0 – 25,000.00	0 – 100,000.
Small	5 to 49	25,000.00- 1 million	100,001-1 million
Medium	50 to 99	One million – five million	One million – ten million
Large	100 or more	More than ten million	More than ten million

**Source:** MSME Policy 2019-2024

In the light of the above SME categorisation in The Gambia, the research sample element has been devised as those SMEs that meet the below criteria:

- i. Must be a client of an Islamic finance institutions or institution that provides Islamic financing products to SMEs.
- ii. Must have received financing in the last three years.
- iii. Must have received financing of GMD 100,000.00 and above.

SMEs that fulfil the above criteria constitute the research sample frame and eventually constitute the sampled elements of the study. It is these SMEs that completed the research questionnaire and will serve as the units of analysis for the research.

## **5.6 The Research Instrument**

### **5.6.1 Developing the Instrument**

A research instrument is described as ‘any tool or technique used by a researcher to collect primary data, including questionnaires, structured interviews, observation forms, and technological devices’ (Saunders et al, 2019 p. 452). Measurement instruments are developed to measure a construct, variable or phenomenon or quantify information on the research variables of interest (Creswell and Creswell, 2018). A psychometrically sound instrument is an instrument that measures what it intends to measure consistently irrespective of time and space (Sarira et al, 2020). Researchers such as Robinson (2018) submit that a psychometric scale conventionally comprises of multiple items, and as such psychometric scales are defined as specialised types of quantitative measures used in questionnaire (Nevill et al, 2001). Psychometric instruments are mainly used to measure latent constructs or variable i.e., variables that are hidden or unobserved in the mind of the respondent as they are abstract in nature and are generally measured using inferences drawn from observed variables (Sarira et al, 2020).

To develop this instrument, the researcher conducted a thorough review of the extant literature on each of the variables in the scale and adapted the questions from prior studies to suit the needs of the present study. When developing scales especially for psychometric scales, it is commonly advised to generate as many items as possible at the early stage of scale development and use generally accepted statistical methods such as factor analysis to determine which items stay in the scale and which items are dropped. The researcher followed this standard practice and generated as many as fifteen items or more initially for each of the

variables and eventually maintained at least five items for each of the constructs after factor analysis. To appropriately measure each of the variables, both conceptual and operational definitions have been provided to have a clear understanding of the variables as a prerequisite for valid measurement. According to Bishop et al (2023) the operational definition of a variable in research specifies the exact procedures used to measure or manipulate a concept, ensuring that it can be observed, quantified, and replicated. It identifies how a variable will be measured in a study and doing so translates an abstract concept into a measurable indicator (Creswell and Creswell, 2022).

## **5.6.2 Objective of the Instrument**

The overarching objective of this instrument is to measure psychometrically some of the elements identified from the literature as impediments to the use of the Islamic participatory modes of financing especially for SMEs and use the scores on those elements to classify SME clients into suitable or unsuitable classes for the use of the Islamic participatory modes of financing. These elements include but not limited to, the trustworthiness of the SME entrepreneur, his skillsets in terms of financial management and entrepreneurial capacities etc. The clear articulation of the goals and objectives of the instrument is critical to guide the researcher in developing an instrument that is fit for purpose.

## **5.7 The Research Variables**

### **5.7.1 Trust**

Trust as a conceptual construct is a subject of interest for many social science disciplines. Despite this convergence, there is still no consensual definition of trust amongst these disciplines and its operational features (Lewis and Weigert, 1985; Mayer et al, 1995). Meanwhile, there is already a growing consensus in the economic literature on the role of trust in building social capital and how trust and trustworthiness are so salient for entrepreneurial success (Becchetti et al, 2022). According to Rousseau et al (1998) trust is defined as a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another. Similarly, Sheppard and Sherman (1998) elucidate that, trust is accepting the risks associated with the type and depth of the interdependence inherent in each relationship.

Trust is literally composed of two principal concepts i.e., Reliance Rotter (1980) and Giffin (1967) and Risk Rousseau et al (1998) and Mayer et al (1995) hence, Currall and Inkpen (2006)

defined trust as a decision to rely on another person, a group or an organisation under a condition of risk. Trust has been seen by some scholars as a psychological state and the disposition of which affects intentions and actions Mayer et al (1995) while other scholars understood it from the behavioural perspective (Whitener et al, 1998). It has been found to be one of the key elements of a successful partnership (Zhdanov, 2021). In fact, trust is said to be the underpinning factor for all cooperative economic activities (Dupont and Karpof, 2020). Meanwhile, the Islamic participatory modes of financing are nothing other than trust-based financing instruments. Hence, trust becomes a pertinent prerequisite for the use of these financing instruments. Moreover, Islam encourages entrepreneurs to incorporate trustworthiness, honesty, and truthfulness in their business dealings (Khalique et al, 2020). In this regard, Ahmed and Aassouli (2022) elucidate that ethics could be a substitute for the costly control, monitoring and verifications involve in the entrepreneurial financing relationships, as ethical parties are expected to be truthful in providing information and fulfilling their contractual obligations. Ethics, although important in financial relations, it is mostly neglected (Drover et al, 2014). A study found that, when equity financiers have trust in SME decision makers, they will make sufficient funding available to SMEs with sufficiently attractive terms even amid information asymmetry (Dowling et al, 2019).

#### **5.7.1.1 Research Operational Definition of Trust**

Trust has been defined by researchers, professionals and academics differently in the extant literature with different considerations on its dimensionality. For this research, the researcher adopted the trust definitions of McAllister (1995) and Currall and Inkpen (2006) who collectively understood trust as a deliberate decision to rely on another person, a group or an organisation under a condition of risk. Thus, trusting someone means to willingly make yourself vulnerable to the actions of another person or group or organisation based on your expectation that the trustee will perform certain action(s) important for your interest and welfare without the need to monitor or control (Mayer et al, 1995). This operationalisation of trust resonates well with the type of trust needed in the use of Islamic participatory modes of financing, which is the focus of this research, in which only one party actively manages the business venture, while the other party entirely relies on his disclosures of the business performance with very little to no room for scrutiny. This form of trust could be understood as interpersonal form of trust, which McAllister (1995) defined as the extent to which one party is confident and willing to act based on the words, actions and decisions of another party. The trust variable in this research is measured based on this understanding.

### **5.7.1.2 Measurement of Trust Variable**

Trust is a highly complex and multi-dimensional phenomenon McKnight and Chervay (2001) and Currial and Judge (1995) argue that researchers should study trusting behaviour as a multidimensional construct. To measure trust intelligently and accurately is a bit problematic, as its measurement is generally rudimentary, anecdotal, and fragmented in the literature. Moreover, measuring an unsettled concept such as trust is a little challenging, considering its definitional quagmire and evolving measuring scales. For instance, McEvily and Tortorriello (2011) have documented over 129 different measures of trust. Trust could be measured directly or indirectly. A direct mechanism of measuring trust allows participants to self-report their trust with or without being bound by a choice while the indirect measurement utilises experimentation by observing individual behaviours, reactions, and decisions to infer trusting expectations (Bauer and Freitag, 2017). The ideal trust measurement scale to use in any study is influenced by the type of trust being studied (Ullman and Malle, 2019). The type of trust that this research intends to measure is relational in nature, i.e., it seeks to measure the extent to which one party places trust in another party (McEvily and Tortorriello, 2011). In the context of this research, the researcher wishes to measure the extent by which the financier (an Islamic financial institution) is willing to be vulnerable to the action(s) of the SME owners by financing them using trust-centric instruments like the Islamic participatory modes of financing.

A psychometric measurement of trust will involve the use of a multi-item survey with questions that intend to measure the theoretical dimensions of trust (McEvily and Tortorriello, 2011). The most cited dimensions of trust construct in the literature include ability, benevolence, and integrity (Mayer et al, 1995). Cognizant of the variant trust measurement scales, McEvily and Tortorriello (2011) elucidated that five existing scales represent the state-of-the-art scales for the measurement of trust notably, (McAllister, 1995; Currial and Judge, 1995; Cummings and Bromiley, 1996; Mayer Davis, 1999; Gillespie, 2003). Thus, many of the items of the trust variable in this research are adapted primarily from these five renowned and tested trust scales. A five Likert-scale ranging from (1) strongly disagree to (5) strongly agree has been used to score the items on the scale.

### **5.7.2 Financial Management Skills**

Many owner-managed SME entrepreneurs are daunted by the idea of bookkeeping and accounting, however, keeping track of incomes and expenses of the firm, improves the chance of making any profits and to prepare appropriate tax returns, access bank loans amongst other

things (Siekei et al, 2013). Financial management in broad terms is the management of the finances of a business to achieve financial goals including raising the required funds and efficiently allocating this scarce resource amongst the competing business needs (Abanis et al, 2013). According to Wickham (1998) a skill which is also synonymous to competence, and ability Perks and Struwig (2005) is the demonstration of knowledge in a certain way. Thus, financial management skill is the ability to manage and implement the financial control systems, collect financial data, analyse financial reports, and make informed financial decisions (Paarima et al, 2021). Academic literature has established that anyone who owns or manages a small business requires financial management skills as a necessary tool to navigate the inescapable waves of economic cyclones (Hoque, 2017). Thus, good financial management skill resonates adequately with firm development and success (Khasanah and Irawati, 2022).

### **5.7.2.1 Research Operational Definition of Financial Management Skills**

Financial management from a management perspective are those activities involved in the management of the firm's financial resources including investing and financing decisions-makings (Dwangu and Mahlangu, 2021). As one of the functional areas of management, financial management plays a central role in firm survival (Meredith, 1986). A good financial management system is the cornerstone of every business and organisation (Zada et al, 2019). In fact, the success or failure of any business venture lies in its financial management practices (Kapitsinis, 2019). In this research, to operationalise the financial management skill as a variable, the definition of Paarima et al (2021) was adopted, who defined financial management skill as the ability to manage and implement the financial control systems, collecting financial data, analysing financial reports, and making informed financial decisions. This definition served as the reference point in the design and the eventual measurement of the financial management skill variable in this research.

### **5.7.2.2 Measurement of Financial Management Skills Variable**

The measurement of financial management skills or competence is complex and multidimensional Ghesquiere et al (2019) and an evolving research area (Lillie et al, 2010). Therefore, the development of any instrument for the measurement of financial management skills should consider it as a multidimensional construct (Engel et al, 2016). In general, the instruments for measuring financial management skills could be categorised into observation-based, self-report or the use to proxy (Moore et al, 2007). Each of these instruments could be used independently or collectively to measure financial management skills (Engel et al, 2016).

Although the measurement of financial management skills varies in the literature, however, Ksendzova et al (2017) argues that the self-reported measurement instrument is predominantly used. The Financial Capacity Instrument of Griffith et al (2003) is one relevant instrument used to measure one's ability to independently manage one's own finances. It is a standard psychometric measurement scale developed to measure the ability of everyday financial activities (Marson et al, 2012). Similarly, the Financial Competence Assessment Inventory (FCAI) developed by Kershaw and Webber (2008) is another popular tool used for measuring individual financial management skills. Hence, this research has utilised these instruments and others to develop the questions for the financial management skill variable.

### **5.7.3 Entrepreneurship Skills**

The cardinal role of entrepreneurship in economic development has been recognised in the literature (Kanaan-jebna et al, 2022 ). An entrepreneur is a person who enters a market to do something new or different (Pallawi et al, 2022). In doing so, he assumes risk and is likely to adopt innovation (Lopa and Bose, 2014). Hence, entrepreneurship entails the development of skills and mindsets that are relevant for the entrepreneur to create and maintain a long-term business success (Azmi and Hashim, 2018). Meanwhile, the concept of skills or competencies are generally understood to be knowledge and skills that a person achieves through education or experience (Bacigalupo et al, 2016; Armuña et al, 2020). Accordingly, Le Deist and Winterton (2005) assert that competence refers to the set of knowledge, skills or abilities that enables a person to successfully perform a certain task. Therefore, entrepreneurship skills are set of knowledge, attitudes and skills that enable an entrepreneur to successfully and profitably develop products and services to suit the taste of his target customers in the society in his line of business. It has also been defined as identifying customer needs, technical or market opportunities and pursuing business opportunities (Hayton, 2015).

#### **5.7.3.1 Operational Definition of Entrepreneurship Skills Variable**

Entrepreneurship is fundamentally personal, as it takes human vision, intension, and work to conceive and translate business ideas into successful products and services (Baum et al, 2007). As a matter of fact, there is no entrepreneurship without individual (Santos et al, 2013), as entrepreneurship requires actions and actions require individuals (McMullen and Shepherd, 2006). McClelland (1987) assert that an entrepreneur always searches for change, respond to it, and exploits it as an opportunity. In this regard, Hashim et al (2018) postulate that entrepreneurial competencies are individual characteristics such as, specific skills, motives,

knowledge, self-images, social roles which have bearing on the creation, survival, and success of a business enterprise. Similarly, Fatriati and Hermiati (2011) highlight that entrepreneurial competencies consist of technical skills required by the entrepreneur to operate a business successfully. It could be understood from the foregoing definitions that entrepreneurial skills or competencies are the core baseline competencies that are required to launch a venture and are imbedded in any entrepreneur who adds value to a business via resource mobilisation and organisation as well as alertness to opportunities for the business (Bird, 2019).

To measure the entrepreneurial skills variable in this research, the definition of Grace Jamie and Oliver (2020) was adopted as the operational definition which states that ‘entrepreneurial skills or competencies are the cluster of related knowledge, attitude, and skills that an entrepreneur must have to deliver outstanding performance and maximise profit for the business. Furthermore, Chandler and Jansen (1992) postulate that the fundamental competencies for successful SME founders to have are entrepreneurial (ability to recognise opportunities and the drive to see firms to fruition and innovativeness), managerial (ability to conceptualise, coordinate, organise and source the requisite resources for the business), and technical (the acquisition of the right tools and knowledge to produce the products and services).

### **5.7.3.2 Measurement of the Entrepreneurship Skills Variable**

The measurement approach of competency has been varied in the extant literature based on assumptions and predictions (Mitchelmore and Rowley, 2010). There are many instruments with adequate psychometric properties to measure the entrepreneurial skills or the enterprising abilities of an individual Ortuño-Sierra et al (2021), namely, Entrepreneurial Attitude Scale for Student Oliver and Galiana (2015), Entrepreneurial Aptitude Test Cubico et al (2010), Measure of Entrepreneurial Talents and Abilities ‘META’ Ahmetoglu et al (2011), and the Entrepreneurial Potential Assessment Inventory (EPAI) (Santos et al, 2013). META is by far the strongest and the most consistent predictor of entrepreneurial activity and most widely accepted measure (Almeida et al, 2014). Based on the dimensions of entrepreneurial skills posulated by Chandler and Jansen (1992) such as entrepreneurial, management and technical, this research sees it fit to measure the entrepreneurial skills variable along these dimensions, hence, the META and EPAI instruments appear to be ideal tools to reckon with in the development of the items for the entrepreneurial skills construct measurement for this research. Thus, these scales and many other scales and articles have been referred to in the development of the entrepreneurial scale for this research.

### **5.7.3.3 Knowledge level of SME operators on Islamic Finance Principles and Products**

According to Wirtz and Mattila (2003) knowledge is defined as ‘the fact or the condition of knowing something with the familiarity obtained by experience or education’. Similarly, for Davenport and Prusak (1998) knowledge could be defined as the optimal synthesis of contextual information, values, framed experience and expert insights to develop a holistic view of a phenomenon. Thus, knowledge is complex and context-specific construct. Generally, decision making by consumers is greatly influenced by the amount of knowledge they store in their memories (Hristov and Kuhar, 2015). Hence, one cannot form an attitude about something, for which one has no knowledge on (Al Balushi et al, 2019). Therefore, knowledge about a product or service is a critical precursor for developing a positive perception and eventual adoption or patronage. When people know more about a product or service, their perceived knowledge is boosted and then they can make more appropriate decisions.

Conteh and Hassan (2021) highlight that adequate knowledge about the Islamic banking principles and products will motivate customers to have a positive perception of Islamic banking. In this regard, many researchers such as Mariadas and Murthy (2017) and Nurdin (2016) have highlighted that, knowledge on the Islamic banking principles and products, is a key determinant for adoption. Hence, on the flipside it is plausible to anticipate that the suppliers of the Islamic finance products and services i.e., (the Islamic finance institutions) would be willing to supply more when their clients (SME operators) have adequate knowledge about their products and services as this will support positive perception and attitude, leading to eventual patronage or genuine demand from the SME clients.

As highlighted by Kayed (2012) a sharp problem that confronts Islamic finance institution, is the limited number of customers that understand the intricacies, nature and philosophy of Islamic finance institutions and their products and services. Meanwhile, it is imperative for both the effective operation of the SME firm and the appropriate implementation of the Islamic participatory modes of financing arrangements that the knowledge level of the SME operator especially on the underlying Islamic principles for these products becomes critical. Arguing along the competence-based view as an angle of the resource-based view paradigm of strategic management, the firm’s performance is a function of both tangible and intangible resources i.e., knowledgeable staff. Research has suggested that knowledgeable staff is a strategic asset

for firms, and there is ample evidence from the extant literature linking the knowledge level of the SME operator with firm performance (Sheehan et al, 2016).

In the Islamic participatory financing arrangements, SME operators become in principle business partners of the banks or the financial institutions that finance them. Therefore, for self-efficacy and smooth running of these partnership financing arrangements, it is in the collective interest of both parties, especially for the financial institutions as financiers to deal with SME operators that have a strong grasp of their financing products especially the delicate ones like the participatory modes.

#### **5.7.3.4 Willingness of SME Operators to Use Islamic Participatory Modes**

In the context of this research, the willingness of small and medium-sized enterprise operator to use Islamic participatory modes of financing refers to the degree to which SME owners or decision-makers are mentally prepared, open, and inclined to adopt Islamic financing arrangements based on profit and loss sharing (PLS) principles. Hence, the construct of ‘willingness’ in this context represents a latent psychological state encompassing intention, preference, and perceived readiness. It is influenced by several antecedents, including religious values, knowledge of Islamic finance, perceived benefits and risks, trust in Islamic financial institutions, and perceived compatibility with business needs (Gait and Worthington, 2009; Amin et al., 2011; Abduh and Omar, 2012). In this framework, willingness functions as a cognitive intention preceding actual uptake or application for Islamic finance.

In this research, willingness was measured as a composite latent construct derived from a set of items in a structured questionnaire administered to SME respondents. The items were designed to capture both attitudinal and intentional components, in line with previous empirical studies (Amin, 2008; Gait and Worthington, 2009; Abduh et al., 2012). This operationalisation aligns with behavioural finance and Islamic economics literature, where willingness is considered a critical precursor to adoption and actual usage of Islamic financial products (Amin et al., 2011; Yusof et al., 2017). The willingness variable was ultimately used as an input in both regression analyses and decision tree models to predict classifications of SMEs into suitable candidates for Islamic participatory modes of financing or not. Prior studies have shown that religious belief alone does not always translate into financing decisions unless supported by awareness, convenience, and positive perceptions of Islamic financial instruments (Dusuki and Abdullah, 2007; Rammal and Zurbruegg, 2007). Therefore, willingness in this study also reflects the cognitive evaluation of the suitability, accessibility, and ethical

soundness of participatory financing mechanisms for SME operations (Haniffa and Hudaib, 2007; Zainol et al., 2014).

## **5.8 The Research Questionnaire**

Measurement instruments are used to collect data from respondents (Sarira El-Den et al., 2020). The instrument used in this research for the collection of the main research data was a questionnaire. The questionnaire was developed and administered electronically via GOOGLE FORMS, which allows the researcher to digitally share the questionnaire with the prospective respondents. Researchers such as (Denscombe, 2010) indicated that when the researcher intends to reach many respondents, a questionnaire becomes the most appropriate and efficient tool to use. In this research, the target respondents are the SME operators that are banking with the institutions that offer Islamic financing products; thus, it was anticipated that the prospective respondents would be spread across the country, hence the suitability of questionnaire instrument for data collection. Similarly, the constraints of time and other resources necessarily point to a questionnaire as the ideal tool to use in data collection. The items of the scales or the questions in this questionnaire have mainly been adapted from existing scales on each of the research variables.

The structure of the questionnaire was designed in line with the standard requirements of a research questionnaire. The questionnaire included a cover or informational page, and four distinct sections that are labelled as (section A, section B, section C and section D). The cover page informs the potential respondents about who the researcher is, the purpose and the topic of the research. It also highlights the researcher's university as well as the main supervisor of the research work. The cover page equally provides the context and role of the potential respondents. The potential respondents were assured of the confidentiality of their responses and that their responses were for the research at hand only. Lastly, the respondents were informed about the approximate time it might take to complete the questionnaire, and the researcher thanked them in advance for their participation and provided his contact details should there be a need for any clarification from the participants.

Except for section A, which contains questions covering generic socio-demographic information of respondents, firm performance or profitability, knowledge and understanding of the Islamic finance principles and products as well as the willingness and preference of using the Islamic participatory modes of financing by the SME operators, section B through D, each

measures a specific research variable including, trust, entrepreneurship skills and financial management skills respectively.

Section B measures the trust variable of the research mainly looking at trust dimensions like ability, benevolence and integrity as indicated by (Mayer et al, 1995). The entrepreneurial skills variable was measured in section C and dimensions such as entrepreneurial, managerial and technical as suggested by Chandler and Jansen (1992) were mainly considered amongst others. Lastly, for the financial management skills variable was measured in section D, and the financial competence assessment instrument by Kershaw and Webber (2008) with over six dimensions was amongst others used to measure this variable. The final version of the questionnaire had a total of 62 items or questions across the four sections including 24 items for section A, 11 for section B, 15 for section C and twelve 12 for section D. In terms of the response format, section A had several response formats including short answers, multiple choice format, and a four Likert scale. However, for section B, C and D, all of them had a five Likert scale response format for all their items in the form of (1) strongly disagree, (2) disagree, (3) neutral, (4) agreed and (5) strongly agree.

### **5.8.1 The Questionnaire Testing (The Pilot)**

Testing of a research instrument known as piloting is a standard practice especially in the realms of academia and psychometric. The piloting of an instrument allows the researcher or the developer of an instrument to have an initial feel of the performance of the instrument and pinpoint areas of improvement. Having consulted the literature in the development of the variables, the researcher initially settled on a seventy-three items scale for the instrument including a demographic section and the three main independent variables i.e., trust, entrepreneurial skills and financial management skills respectively for the pilot. The demographic section contains 25 items. The trust variable had 15 items, 18 items for entrepreneurial skills and 15 items for financial management skills.

For the administration of the pilot study of the instrument, the researcher used the SME database of The Gambia Import and Export Promotion Agency commonly known as 'GIEPA'. The MSME department of the agency is charged with amongst other things, mentoring and supporting Gambian small businesses to grow through training, marketing and branding, provision of mediated funds as well as linking and equipping them with the means to source external funding for their businesses. The agency maintains a database of The Gambian SMEs that have in one way or the other benefited from any of their interventions. The researcher

contacted GIEPA initially via WhatsApp call, and after a few more calls and exchange of email correspondences, the office agreed to share a list of SMEs from their database. From the list of 38 SMEs provided, 30 SME operators completed the questionnaire for the pilot, giving a 78 per cent response rate. The initial analysis of the instrument was conducted based on these respondents.

### **5.8.2 Instrument Validation**

A research instrument validation is the process of assessing the appropriateness of the instrument to conduct the collection of the research data. In other words, this process seeks to determine whether the instrument is fit for purpose. In the realms of developing research instruments for psychometrics, the concepts of reliability and validity take a central stage. The field of psychometric provides a way to quantify the precision of the measurement of latent concepts or variables such as skills, knowledge, satisfaction etc., which could not be directly measured as done in the physical world such as weight, height, length, temperature etc. The product of psychometrics is the development of measurement scales (Bannigan and Watson, 2009). Reliability and validity are research techniques that are used to evaluate the accuracy of measurement scales. The concepts of reliability and validity may appear to be easy to understand, but in the field of psychometrics, they become less easy to comprehend as there are normally no ‘gold standard’ for most of the psychological latent concepts and research variables, against which to compare the scale scores. The relationship between reliability and validity of a scale is such that validity is predicated on and preceded by reliability. Thus, reliability is a necessary but not sufficient component of the validity of an instrument. To confirm the reliability and validity of a tool, is a prerequisite for assuming the integrity of the results of the measurement scale (Holli et al, 2007).

### **5.8.3 Reliability**

Reliability according to Sarira et al (2020), assesses whether a measurement instrument produces consistent results over repeated administration. Reliability or the consistency of a measuring scale is simply the stability of the scale i.e., how far the scale can produce consistent or similar results any time it is used. According to (Utwin, 1995 p.6), ‘reliability is a statistical measure of how reproducible the instruments data are’. Reliability is also equated to dependability, consistency or stability by (Polit and Hungler, 1995). According to McDowell and Newell (1996) the reliability of a scale is concerned with the error in measurement. Thus, reliability assesses the extent to which a score is free from random error, as it is assumed that

there will always be a degree of random error in the administration of a measurement scale (Bannigan and Watson, 2009). The extant literature has revealed different forms of assessing the reliability of a measuring scale and some of the commonly used ones include internal consistency commonly understood as Cronbach's alpha, test-retest and equivalence amongst others.

Internal consistency is arguably one of the most widely used method of testing the reliability of a scale. This technique of reliability testing seeks to assess how well a group of items measure the same characteristic, i.e., a group of items measuring the different aspects of the same concept or variable (Utwin, 1995 p. 6). An instrument is said to be internally consistent when its subparts are measuring the same characteristic (Polit and Hungler, 1995). Amongst the variety of methods of testing for internal consistency, Cronbach's alpha is the most popular (Bannigan and Watson, 2009). As Nunally (1967) reports Cronbach's alpha is the best estimate of reliability as many errors in measurement instruments emanate from their contents. In this research, the reliability of the scale was tested using Cronbach's alpha technique of internal consistency. The variables in this research are multi-dimensional, thus that makes Cronbach's alpha method of reliability testing as the most appropriate technique to utilise.

**Table 5.4 Scale Reliability Statistics**

	<b>Cronbach's <math>\alpha</math></b>	<b>McDonald's <math>\omega</math></b>	<b>Number of items</b>
Trust, Entrepreneurial Skills and Financial Management Skills	0.98	0.98	48
Trust	0.94	0.95	15
Entrepreneurial skills	0.96	0.96	18
Financial Management Skill	0.95	0.96	15

The above table indicate the alpha coefficients of the items in the scale for the variables. The coefficient values of 0.98, 0.94, 0.96 and 0.95, are for the combined variables, as well as for each of the main research variables including trust, entrepreneurial skills and financial management skills variables respectively, indicate that the instrument is unapologetically reliable to measure the concern variables. Nunnally and Bernstein (1994) from their book on psychometric theory postulated that a Cronbach's alpha of 0.70 or higher is acceptable for newly developed measures. Meanwhile, George and Mallery (2019) categorised a Cronbach's alpha value of  $\geq .90$  as excellent. Thus, the researcher proceeded into the next phase of the validation process with this instrument development. Once an instrument has been proven to

be reliable, the next logical step in the validation process is to determine whether is measuring what it intends to measure through validity checks.

### **5.8.5 Validity**

The validity of a measuring assesses how well the instrument measures what it intends to measure (Taherdoost, 2016). It is ‘an integrated evaluative judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores or other modes of assessment’ (Messick, 1989, p.14). In common parlance, validity seeks to answer the question; has the instrument done the required job? The validity of a measuring instrument is concerned with the meaning and interpretation of the scores generated by the scale. Carmines and Zellar, (1979) indicate that validity is not an absolute thing but rather a matter of degree, thus it is not an ‘all or nothing concept’. The assessment of validity could be done along many parameters such as the content, criteria and construct. Gould (1994) elucidates that it is not possible to take one form of measurement validation in isolation of the other as many forms may be applicable for the same instrument. The validity of the instrument in this research has been tested by face validity, content validity as well as constructs validity.

Face validity and content validity are closely related concepts, and they form the minimum requirements for the acceptance of a scale (Bannigan and Watson, 2009). Face validity has been reported by Dempsey and Dempsey (1992) as the fastest method of determining validity. Face validity assesses whether a measurement scale looks reasonable i.e., whether the items included in the scale are relevant in measuring the variable. Face validity is not tested using statistical methods, but rather it looks at the subject’s acceptance and understanding of the tool. Gould (1994) maintains that the measurement tool must be understandable and perceived as relevant by the subjects to ensure their co-operation and motivation. Thus, face validity provide insight into how potential respondents might interpret and respond to the scale items. Researchers use both experts and lay people to review the instrument for grammar, appropriateness, logical flow etc. Put differently, face validity is the researcher’s subjective assessments of the presentation and relevance of the measuring instrument as to whether items in the instrument appear to be relevant, reasonable and clear (Oluwatayo, 2012).

Content validity is the degree by which items are relevant to and representative of the defined construct (Haynes et al, 1995). The content validity of a scale assesses whether all the relevant items are included. From a psychometric perspective, this means the extent to which the

measure adequately samples all the possible questions that exist (Bannigan and Watson, 2009). This validity could be assessed by either a review by an expert or subject matter specialist, a comparison with the literature or both. The objective of content validity is to achieve authenticity i.e., to ensure all concepts and or dimensions relevant to a construct are included in the instrument (Messick, 1994). The difficulty of content validity for researchers is that there is no definitive list of correct content Gould (1994) thus it is not possible to establish the total content validity (Arnell and Sim, 1993). To reduce this difficult, the domain of the content must be defined in the planning stages or early in the development of the instrument rather than making a judgement on it at the later stage (Gould, 1994). Thus, content validity is closely related with construct validity.

Construct validity is the main form of validation of a test. In the absence of a gold standard or an existing reference point or criterion, the validity of a scale could be tested by assessing 'to what extent the measurement scale under development correlates with the construct under investigation' (Polit and Hungler, 1995). The procedure of testing construct validity begins with defining the topic or constructs to be measured McDowell and Newell (1996) and it may be expressed as hypotheses as well indicating what correlations are expected. Construct validity is part science and part arts and cannot be proven definitively i.e. 'it is a continuing process in which testing contributes to outstanding of the construct (McDowell and Newell, 1996). The features of a good study on construct validity includes, stating clearly the hypothesis and the justifications, testing the hypotheses and commenting on the results. Construct validity could be assessed through convergent validity, factorial validity or discriminant validity. The factorial validity method of validity assessment involves the use of statistical procedure to reduce a large set of variables into smaller set of variables with common characteristics or underlying dimensions (Polit and Hungler, 1995). It examines how far the items accord in measuring one or more common themes (McDowell and Newell, 1996).

In establishing the face validity of this research instrument, the researcher selected at random ten respondents from the pilot data and contacted them via WhatsApp calls, to assess their level of comprehension and comfort with the questionnaire items. Their feedback has been used to refine the final version of the instrument. Equally, subject matter experts have also contributed to assessing the face validity of the instrument by reviewing and commenting on the initial draft. Similarly, since the items of the constructs in this instrument have been mainly adapted from existing scales whose validity have been reported in the literature, the researcher conducted a comparison with the literature establish validity.

Concerning the construct validity of the instrument, the researcher both conceptually and operationally defined each variable of the instrument. This provided a clear understanding of what is to be measured and along which dimensions. Construct validity is the degree to which an instrument measures the construct it intends to measure (Cronbach and Meehl, 1955). It is support when the instrument's items are related to its operationally defined theory or concept (Holli et al, 2007). Several ways exist by which construct validity could be evaluated including hypothesis testing, factor analysis etc.

A factor is a combination of a test items that are believed to belong together (Holli et al, 2007). As the main form of validity check for this instrument, the researcher conducted factor analysis on the pilot data to determine the factorial distribution of the data and to help identify which of the construct items might not be very useful in its measurement hence deleted. For item deletion, items that do not load on the right factor were deleted first and secondly, items with loadings below the threshold were also deleted. The final version of the instrument used for the actual research data collection included a total of 62 items including, 24 items for the sociodemographic data in section A including; firm performance, knowledge and understanding of Islamic finance principles and products as well as preference and willingness to use Islamic participatory modes of financing by SME operators, 11 items for trust construct in section B, 15 items for the entrepreneurial skills construct in section C and finally, 12 items for the financial management skill construct in section D.

## **5.9 Data Processing**

The researcher has undertaken several activities in the preparation of the research data for processing. These activities were systematically and coherently done to ensure the accuracy of the data used to process and produce the research results. These activities mainly include data collection procedure, data checking and editing as well as data coding and the handling of missing values. In terms of the data collection procedure, the main data of the research was collected through a survey questionnaire. The research data was collected for a period of six months from January to June 2024. At the end of the data collection period, 311 respondents have completed the questionnaires. The research data were subsequently checked for completion and adjustments done accordingly. The questionnaire responses were generated in a CSV format and checked for accuracy. From the total responses of 311, six (7) responses were completely removed due to duplications, thus, 304 responses were left for further scrutiny.

In terms of the missing values of the data, the missing values of the data were left empty as less than 2 per cent of the data have been found to be missing which is believed to have no significant effect on the accuracy of the data for analysis. In this regard, according to Little and Rubin (2019), missing data less than 5 per cent is generally considered inconsequential and unlikely to introduce significant bias in statistical analysis. Hence, the missing data was not replaced and was left blank. It is pertinent to note that data checking and editing has a profound effect on data accuracy, which also has an overriding effect on the research results as well as the achievement of the research objectives.

The research data analysis has been grouped into two primary empirical chapters. The first empirical chapter looks the psychometric analysis using multiples regression. The Jamovi software used in analysing the first empirical part of this research data is developed by a team of developers who branched off from JASP (The jamovi project, 2019). Jamovi is free and user-friendly software which has advanced calculations program and allows for the creation of complex statistical analysis, for manipulation, filtering, selection and combination of data (Milanes-Baños, 2024). Jamovi software version 2.6.44 was the main software used to analyse the first empirical chapter of this research data. The second empirical part was analysed using the WEKA software. This empirical chapter looks at the data mining technique of decision tree classification as a way of discriminating between prospective SME clients who are suitable for the use the Islamic participatory modes and from those who are not. The software, officially known as the Waikato Environment for Knowledge Analysis, was developed by a group of machine learning researchers at the University of Waikato in New Zealand (Ian et al, 2011). The WEKA software is a collection of machine learning algorithms that are used to perform data mining tasks (Hamoud, 2016). This software was used to carry out the decision tree classification technique as the data mining component of the research.

## **5.10 Empirical Models**

### **5.10.1 Multiple Regression**

Multiple regression analysis is one of the empirical models employed in analysing this research data, and its results are used to subsequent test the research hypotheses. Multiple regression method of data analysis seeks to estimate or predict the relationship between a dependent variable and one or more independent or predictor variable(s) (Conteh, 2020; Saunders et al, 2019). It allows us to model the relationship between a dependent variable and one or more predictors and to understand how the typical value of the dependent variable changes when any

one of the independent variables is varied (Field, 2018). Multiple regression works on the assumption that there is a linear relationship between the dependent variable and the each of the independent variables and that there is no major correlation between the independent variables which is known as multicollinearity (Conteh, 2020; Saunders et al, 2019). In this research, the key dependent variable is the decision of Islamic finance institutions or service providers to use the Islamic participatory modes of financing for SMEs. This is a proxy variable created by the index of operator trustworthiness and firm performance and is predicted by variables such as, Entrepreneurial Skills and Financial Management Skills of prospective SMEs partners, willingness of the SME operators to the participatory modes, financial ratios (composite variable of, solvency ratio, operating leverage ratio, and financial leverage ratio) and non-financial ratios (a composite variable of, firm age, ownership status, respondent's age, years of business experience and educational level). The research uses several empirical models to estimate the relative impact of the independent variables on the dependent variable.

$$Y1 = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_{12}x_{12} + u \quad \text{Model 1}$$

$$Y2 = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_{17}x_{17} + u \quad \text{Model 2}$$

$$Y3 = \beta_0 + \beta_{14}x_{14} + \beta_{15}x_{15} + \beta_{16}x_{16} + \beta_{17}x_{17} + u \quad \text{Model 3}$$

$$Y4 = \beta_0 + \beta_{14}x_{14} + \beta_{17}x_{17} + \beta_1x_1 + \beta_2x_2 + \beta_5x_5 + \beta_8x_8 + \beta_9x_9 + \beta_{11}x_{11} + \beta_{12}x_{12} + u \quad \text{Model 4}$$

$$Y5 = \beta_0 + \beta_{14}x_{14} + \beta_{15}x_{15} + \beta_{16}x_{16} + \beta_{17}x_{17} + \beta_{18}x_{18} + \beta_{19}x_{19} + u \quad \text{Model 5}$$

$$Y6 = \beta_0 + \beta_{14}x_{14} + \beta_{15}x_{15} + \beta_{16}x_{16} + \beta_{17}x_{17} + \beta_{18}x_{18} + \beta_{19}x_{19} + u \quad \text{Model 6}$$

**Where:**

Y1 = The firm or project performance (financial predictors only).

Y2 = The firm or project performance (financial and psychometric predictor variables).

Y3= Operator Trustworthiness (addressing moral hazard issues in Islamic participatory modes of financing (Psychometric predictor variables)

Y4= Operator Trustworthiness (addressing moral hazard issues in Islamic participatory modes of financing (Psychometric and financial predictors).

Y5= Decision of Islamic finance institutions to use the Islamic participatory modes of financing for SMEs (based on factor scores of variables)

Y6 = Decision of Islamic finance institutions to use the Islamic participatory modes of financing for SMEs (based on mean scores of the variables).

$\beta_0$  = Constant

X1 Firm age, X2 Business sector, X3 Business location of the business, X4 Number of employees, X5 Gender, X6 Ownership Status, X7 Respondent's age, X8 Years of business experience, X9 Educational level, X10 Solvency ratio, X11 Operating leverage ratio, X12 Financial leverage ratio, X13 Trust, X14 Entrepreneurial skills, X15 Financial management skills, X16 Willingness of SMEs to Islamic participatory products, X17, Knowledge level on Islamic finance principles and products, X18 Financial Ratios, X19 Non-financial Ratios.

$\mu$  = Error

### **5.10.2 Decision Tree Analysis**

Decision Tree as the name implies, is a type of statistical method which uses graphical presentation of the decision-making process under specified conditions (Mittal et al, 2017). A decision tree is also defined as a tree-like structure of decision-making flow process, in which each nodes shows a feature (attribute), each link (branch) shows a decision (rule) and each leaf shows the outcome (categorical or continuous) (Pate and Prajapati, 2018). Thus, a decision tree is a predictive modelling method of data classification technique that classifies data based on the attributes of the dataset using an inverse of natural tree-like structure (with root at the top and leaves at the bottom) to depict the decision-making processes. Decision making is one of the most complex human endeavours, whether it is personal or professional, decision making is a never-ending human exercise that has both qualitative and quantitative effects. Thus, professional decisions affect organisations both in terms of goal achievement and survival. Decision tree analysis helps to determine whether the decision made under certain constraints is optimal or not. The decision tree as a data mining technique identifies the most significant variables in predicting the decision outcome, while succeeding variables further discriminate between the decision outcomes (Andoh-Baidoo et al, 2013). The decision tree technique also provides additional insights on the conditional relationships between independent and dependent variables which may not have been established by postulated hypotheses (Osei-Bryson and Ngwenyama, 2011).

In this empirical analysis, we attempt to classify SME entrepreneurs into either a suitable or unsuitable class to inform the use of the Islamic participatory modes of financing, which are an equity-like or 'skin-in-the-game' type of financing arrangements. The two main scoring

techniques used to construct the decision tree include the mean score and factor score. For the decision tree analysis, the target or dependent variable is considered as the class variable which is measure in this case by using the index of mean score of trust and firm performance in the first model and factor score of trust and firm performance in the second model. The predictor or attributes include financial management skills, entrepreneurial skills, knowledge level of SME entrepreneurs on Islamic finance principles and products, willingness of SME entrepreneurs to use the Islamic participatory modes of financing, financial ratios and a composite variable of firm and entrepreneurs' sociodemographic factors called the non-financial ratios.

The empirical analyses in this study rely on cross-sectional regression and data mining decision tree techniques which are primarily designed to identify associations and non-linear relationships and interaction effects rather than establish causality (James et al., 2021), in this case, to examine the relationships between entrepreneurial characteristics, firm attributes, and SME financing outcomes. Hence, the absence of a formal causal identification strategy like panel data, instrumental variables, propensity score matching etc is reflective of both data constraints and the exploratory nature of the research. The dataset available for this research is cross-sectional in nature, capturing SME-level information at a single point in time. As noted by Wooldridge (2010), causal inference typically requires either temporal variation (e.g., panel data) or exogenous variation (e.g., valid instruments), both of which are not available in this study. Due to the absence of valid instruments and the limitations of the dataset, formal endogeneity correction techniques were not implemented. Instead, the study relies on theory-driven model specification and cautious interpretation of results. Consequently, the findings are interpreted as conditional correlations rather than causal effects. Considering these constraints, the study adopts an associational approach consistent with post-positivist research traditions, where the objective is to identify empirical regularities and test theoretically derived relationships (Creswell, 2014). This approach is common in exploratory and early-stage empirical research, particularly in under-researched contexts where data availability is limited as the case is in the case of the Islamic participatory modes of financing especially in a market such as The Gambia where were the industry is severely underdeveloped.

Despite the above highlighted constraints, several methodological steps were taken including the use of control variables, multiple model specifications for robustness checks etc to reduce the biases arising from the omitted variables. Accordingly, the findings of this study should be interpreted as conditional correlations rather than causal effects. Moreover, the observed

associations amongst the variables in the study align with existing theoretical expectations regarding entrepreneurial behaviour and SME financing, thereby enhancing the interpretive relevance of the findings. Rather than making strong causal claims, the study contributes by identifying empirically grounded patterns that are consistent with theoretical expectations. While the study is subject to limitations related to causality, endogeneity, and omitted variables, it offers a theoretically informed and empirically grounded analysis of SME financing in The Gambia considering the Islamic participatory modes. The findings should be interpreted with appropriate caution, while recognising their contribution to an emerging area of research.

**Table 5.5 List of Some Scales Utilised in Developing the Research Questionnaire**

<b>Trust</b>			
<b>Author(s)</b>	<b>Topic</b>	<b>Scale description</b>	<b>No. of items on the scale</b>
Shays S. Tzafrir and Simon L. Dolan (2004)	A Scale for Measuring Manager–Employee Trust	This scale measures interpersonal trust.	16
Murray C. Clark and Roy L. Payne (1997)	The nature and structure of workers’ trust in management	This scale measures interpersonal trust.	52
Daniel J. McAllister (1995)	Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations	This scale measures interpersonal trust.	29
Bill McEvily and Marco Tortoriello (2011)	Measuring trust in Organizational research: Review and recommendations	This articles existing scales of measuring trust	207
Cummings, L. L., and Bromiley, P. (1996)	The organizational trust inventory	This scale measures interpersonal trust.	12
Mayer Davis, R.C., and Davis,J.H. (1999)	The effect of the performance appraisal system on trust for management: A field quasi-experiment.	This scale measures interpersonal trust.	21
Gillespie, N. (2003)	Measuring trust in work relationships: The Behavioural Trust Inventory.	This scale measures interpersonal trust.	10
Steven C Currial, Timothy A Judge (1995)	Measuring Trust Between Organizational Boundary Persons	This scale measures interpersonal trust.	20

**Table 5.5 Entrepreneurial Skills**

Armanurah Mohamad, Muhammad Hussin, and Nor Aishah Buang (2014)	Exploring Dimensions of Entrepreneurial Skills among Student Enterprise at Higher Learning Institution in Malaysia: A Case of Student Enterprise of University Utara Malaysia	The scale measures the entrepreneurial skills amongst student enterprise at Malaysian high learning institutions	23
Serena Cubico, Elisa Bortolani, Giuseppe Favretto and Riccardo Sartori (2010).	Describing the entrepreneurial profile: the entrepreneurial aptitude test (TAI)	This scale seeks to describe the profile of an entrepreneur; thus, differentiating between entrepreneurs and non-entrepreneurs.	23
Viral Acharya, Abhilasha Rajan, and Antoinette Schoar (2007).	What determines entrepreneurial success? A Psychometric study of rural entrepreneurs in India	The scale seeks to identify what factors contribute to entrepreneurial success.	20
Amparo Oliver and Laura Galiana (2015)	Development and Validation of the Escala de Actitudes Emprendedoras para Estudiantes (EAEE)	The scale seeks to validate Entrepreneurial Attitude Scale for Students (EASS).	18
Nusrat Zahan Lopa and Tarun Kanti Bose (2014)	Relationship between Entrepreneurial Competencies of SME Owners/Managers and Firm Performance: A Study on Manufacturing SMEs in Khulna City	The scale measures the relationship between entrepreneurial characteristics and firm performance.	37
Caird, Sally (2013)	General measure of Enterprising Tendency test.	The scale seeks to measure the role of trainings in promoting enterprising potential	54
Noor Ul Hadi and Naziruddin Abdullah (2018)	The leverage of entrepreneur skills and entrepreneur traits to business success: a case study of Pakistan's marble industry	The scale measures the link between entrepreneurial skills and traits and firm success.	18

**Table 5.5 Financial Management Skills**

Fazelina Sahul Hamid and Yiing Jia Loke (2020)	Financial literacy, money management skill and credit card repayments	The study seeks to determine the relationship between socio-economics factors and credit repayment decisions	5
Angela R. Ghesquiere, Caitlin McAfee, and Jason Burnett. (2017)	Measures of Financial Capacity: A Review	This paper reviews articles that look at measuring financial capacity	10
Corrinna L. Kirsten (2018)	The role of financial management training in developing skills and financial self-efficacy	The study seeks to explore the relationship between tailored trainings and financial management of SMEs.	18
Wolmarans, H. P., and Meintjes, Q. (2015)	Financial management practices in successful Small and Medium Enterprises (SMEs).	The paper helps to highlight which financial management skills are important for SME success	N/A
Gawali and Gadekar, Prof. Ravindra B. Gawali, Dr. Ashutosh Gadekar (2015)	Financial Management Practices in Micro, Small and Medium Enterprises-An Exploratory Analysis with the help of Literature Review	This paper reviews articles that look at the financial management practices of SMEs	N/A
Dew and Xiao (2011),	The Financial Management Behaviour Scale: Development and Validation	the authors developed a scale to assess individuals' financial management behaviours.	15

In the succeeding section, we discuss how the items from these scales were adapted and process such as factor have been used to determine the items of the scales in this study are discussed in the succeeding sections.

## 5.11 Conclusion

The chapter presented the methodological framework underpinning the research, outlining the systematic processes used to investigate the critical factors influencing the adoption of Islamic participatory financing instruments such as *Musharakah*, *Mudarabah* and *Musharakah Mutanaqisah* among SME entrepreneurs. The research methodology outlined in this chapter is designed to rigorously and comprehensively address the research questions. Given the exploratory and predictive nature of the study, a quantitative research design was deemed most appropriate, allowing for the measurement of relationships between identified constructs and the development of a predictive model using psychometric and data mining techniques. The study employed a structured survey instrument as the primary tool for data collection. The questionnaire was carefully designed to capture data on key constructs derived from the literature and theoretical framework namely trust, financial management skills, entrepreneurial skills, knowledge on Islamic finance principles and products, and the willingness of SME entrepreneurs to adopt the Islamic participatory financing instruments. The data analysis strategy includes both descriptive and inferential statistical techniques, as well as supervised learning models in the case of decision tree classification algorithms. The choice of the empirical models is guided by both methodological and philosophical considerations. This study prioritises interpretability, transparency, and theoretical alignment alongside predictive accuracy. In this regard, Decision trees offer a clear and intuitive structure that allows for straightforward interpretation of relationships between variables. This is particularly important in the context of this research, which seeks not only to predict outcomes but also to understand how entrepreneurial characteristics and firm attributes influence those outcomes. The tree-based structure enables the identification of key decision rules and variable interactions in a manner that is easily interpretable by both researchers and practitioners. This aligns with the post-positivist emphasis on generating empirically grounded yet explainable knowledge (Creswell, 2014). Furthermore, the nature and size of the dataset informed the methodological choice. In smaller or moderately sized samples such as in this research, decision trees can provide robust and reliable results without the additional complexity associated with ensemble learning techniques.

## CHAPTER 6

### ANALYSIS OF DESCRIPTIVE STATISTICS

#### 6.0 Introduction

The descriptive statistics provide important insights into the structural, demographic, and behavioural characteristics of the SMEs surveyed. The chapter began with the data entry and coding mechanism, followed by a frequency analysis on the research variables including the Pearson correlation matrix analysis, before diving into the descriptive analysis of the research variables.

#### 6.1 Data Entry and Coding

The responses for this study were collected via an online questionnaire and exported in CSV format. The raw dataset was subsequently imported into Jamovi software (version 2.6.44) for analysis. Upon importation, responses in Section A (Operator demographics and firm profile) were mostly in text format, whereas Sections B through D variables were recorded in numeric format. Prior to data coding, a comprehensive frequency analysis was conducted across all questionnaire items to identify the extent of missing data, and this informs the decisions regarding its treatment. The analysis revealed that the highest number of missing responses i.e., 36 was recorded for Item 18, which assessed respondent's knowledge and understanding of Islamic banking principles and products. This item falls under the demographic and firm profile section of the instrument. Given its non-central role in hypothesis testing, the missing responses were retained in their original state. For the main research variables, the highest count of missing responses was 17, representing approximately 5 per cent of the total dataset. Following the recommendation by Little and Rubin (2019) who argue that missing data below 5 per cent is generally considered inconsequential and unlikely to introduce bias, these missing entries were left unaltered. Accordingly, no imputation techniques were applied. Therefore, none of the missing items in the data have been replaced. In coding the responses, a numerical system was adopted; the first response option for each item was coded as 1, the second as 2, and so on in sequential order up to the final response category. Specifically for the dummy variables like gender, business location and business sector, male is coded 1 and female 0, 1,2 and, 3 are put together as urban location and coded 1, while 4 to 7 and combinedly coded as 0 for the rural location and finally, retail and general merchandise are put together as category 'retail trading'

and coded 1, while manufacturing, services and Agri business are put together as ‘non-trading’ and coded 0.

## 6.2 The Frequency Analysis

The firm-level variables reveal substantial heterogeneity in organisational attributes. For instance, the age of firms ranges from 0 to 37 years, with a mean of 9.24 years, indicating that the sample comprises both newly established and relatively mature enterprises. The business sector and business location variables, both coded dichotomously, show mean values of 0.626 and 0.839 respectively, suggesting that most firms fall within the categories coded as 1 i.e., retail trading and urban location. This indicates a concentration in specific sectors and urban locations, which may have implications for interpreting sectoral or geographical effects.

**Table 6.1 Frequency Analysis of the Research Variable**

<b>Variables</b>	<b>N</b>	<b>Missing</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Firm Age	303	1	9.24	7	6.64	0	37
Business Sector	302	2	0.626	1	0.49	0	1
Business Location	304	0	0.839	1	0.37	0	1
No. of Employees	304	0	1.58	1	1.03	1	5
Ownership Status	304	0	1.16	1	0.38	1	3
Respondent's Age	304	0	3.43	3	0.77	1	5
Years of business Experience	304	0	4.27	5	1.72	1	6
Educational Level	300	4	3.44	4	1.34	1	5
Solvency Ratio	294	10	4.47	4	2.56	1	9
Operating Leverage Ratio	289	15	3.71	3	2.22	1	9
Financial Leverage Ratio	292	12	3.43	3	2.20	1	9
Gender	304	0	0.75	1	0.43	0	1
Trust	295	9	4.53	4.6	0.57	2	5
Entrepreneurial Skills	287	17	4.23	4.45	0.73	1	5
Financial Management Skills	301	3	4.05	4.2	0.18	1	5
Knowledge level on Islamic Finance Principles and Products	268	36	1.53	1.56	0.42	1	2
Willingness of SME Operators to use Participatory Modes	304	0	3.22	3.5	0.75	1	4

The number of employees shows an average value of (1.58) confirming that most of the enterprises can be classified as micro or small firms. A similar pattern is reflected in the ownership status variable (mean=1.16) where most respondents identify with the owner category, showing the dominance of sole proprietorships. Respondent’s age and years of business experience display moderate variation, with mean values of 3.43 and 4.27 respectively, showing that business operators tend to be relatively experienced, which may

influence their managerial competence and openness to financial innovations. The education levels also demonstrate wide dispersion, with a mean of 3.44 and a standard deviation of 1.34, implying that respondents possess varying degrees of formal education. This diversity is relevant because educational attainment is often associated with differences in financial literacy, strategic orientation, and business decision-making.

Financial ratios show considerable variability. The solvency ratio (mean = 4.47, SD = 2.56) and operating and financial leverage ratios (means of 3.71 and 3.43) respectively, indicate that while some SMEs exhibit strong financial positions, others operate with higher leverage and potentially greater financial vulnerability. These variations are considerably important determinants of firm stability and performance. Behavioural and capability-related variables present an interesting pattern. Trust (mean = 4.53), entrepreneurial skills (mean = 4.23), and financial management skills (mean=4.05) all show high average scores, suggesting that respondents generally perceive themselves as competent and confident in their business capabilities. However, the notably lower mean score for knowledge of Islamic finance principles and products (1.53) reveals a significant knowledge gap. This suggests that while respondents may possess general business skills, their awareness or understanding of Islamic finance principles and products remains limited.

Finally, willingness to engage in participatory Islamic finance modes (mean = 3) is relatively strong, indicating that despite their low level of knowledge, SME operators show openness toward adopting Islamic participatory financing mechanisms. This discrepancy between knowledge and willingness highlights potential areas for policy intervention, capacity-building programmes, and financial literacy initiatives.

### **6.3 Pearson Correlation Analysis**

Pearson correlation which is also known as the product moment correlation coefficient Sedgwick (2012) is a statistical method that is used to assess the strength (statistical significance) and the direction (whether positive or negative) of the relationship between two continuous variables that have a linear relationship (Conteh, 2020; Field, 2018). The measure of the strength of the relationship ranges from -1(perfectly negative correlation) through 0 (no correlation) to +1 (perfectly positive correlation). It is suggested by (Field, 2005), that the coefficient correlation should not be above 0.8 to prevent multicollinearity. In this research, we seek to examine the relationship between the decision of IFI's to deploy the Islamic participatory modes of financing for SMEs and some variables such as the SME operators'

entrepreneurial skills, financial management skills, willingness to use the participatory modes, knowledge level on Islamic finance principles and products, financial ratios and non-financial ratios. The correlation of these variables with the target variable based on their mean and factor scores are presented below.

**Table 6.2 Correlation Matrix based on Mean Scores**

		IFI's Dec	Entpr Skls	FM Skls	SME Wln	Knw Lvl	Fin R	Non-fin R
IFI's Dec	Pearson's r	—						
	df	—						
	p-value	—						
Entpr Skls	Pearson's r	0.245***	—					
	df	268	—					
	p-value	<.001	—					
FM skills	Pearson's r	0.344***	0.421***	—				
	df	278	284	—				
	p-value	<.001	<.001	—				
SME Wln	Pearson's r	0.255***	0.324***	0.390***	—			
	df	280	285	299	—			
	p-value	<.001	<.001	<.001	—			
Knw Lvl	Pearson's r	-0.275***	0.009	-0.052	-0.216***	—		
	df	252	254	263	266	—		
	p-value	<.001	0.886	0.395	<.001	—		
Fin R	Pearson's r	0.818***	0.133*	0.202***	0.142*	-0.151*	—	
	df	272	270	282	284	254	—	
	p-value	<.001	0.029	<.001	0.016	0.016	—	
Non-fin R	Pearson's r	0.264***	0.013	0.023	0.005	0.213***	0.242***	—
	df	275	280	294	297	262	279	—
	p-value	<.001	0.823	0.687	0.934	<.001	<.001	—

Note. \* p < .05, \*\* p < .01, \*\*\* p < .001

The correlation analysis reveals several statistically significant relationships among the study variables, providing important insights into the behavioural, financial, and knowledge-based factors shaping the IFI's decision regarding deploying participatory financing modes for SMEs. The results show a strong and highly significant positive relationship between IFI's decision and the financial ratios variable ( $r = 0.818$ ,  $p < .001$ ). This suggests that IFIs are more inclined to deploy participatory modes to SMEs with stronger financial health. Similarly, entrepreneurial skills ( $r = 0.245$ ,  $p < .001$ ), financial management skills ( $r = 0.344$ ,  $p < .001$ ), non-financial ratios ( $r = 0.264$ ,  $p < .001$ ) and SME operator's willingness to use Islamic

participatory modes ( $r = 0.255, p < .001$ ), all show a moderate positive correlation with IFI's decision to deploy the Islamic participatory modes. These associations indicate that SMEs with higher competency levels and proactive behavioural orientations including firm and operator specific attributes are critical factors for the use of participatory modes by IFIs. In contrast, SME operator's level of knowledge on Islamic finance principles and products negatively associated with the IFI's decision ( $r = -0.275, p < .001$ ). This result is counterintuitive, as it suggests that the IFIs are less willing to deploy participatory modes to SME operators with high level of knowledge on the IF principles and products.

Overall, the correlation structure underscores the central role of financial performance and managerial skills in influencing IFI's decision to deploy participatory in financing SMEs, while highlighting a paradoxical and yet important gap between knowledge and IFI's decision-making which has strong policy and practical implications.

**Table 6.3 Correlation Matrix based on Factor Scores**

		IFI's Dec	Entpr Skls	FM Skls	SME Wln	Knw Lvl	Fin R	Non-fin R
IFI's Dec	Pearson's r	—						
	df	—						
	p-value	—						
Entpr Skls	Pearson's r	0.420***	—					
	df	268	—					
	p-value	<.001	—					
FM Skls	Pearson's r	0.506***	0.407***	—				
	df	278	284	—				
	p-value	<.001	<.001	—				
SME Wln	Pearson's r	0.431***	0.306***	0.384***	—			
	df	280	285	299	—			
	p-value	<.001	<.001	<.001	—			
Knw Lvl	Pearson's r	-0.145*	0.015	-0.047	-	—		
	df	252	254	263	0.206***	266	—	
	p-value	0.021	0.813	0.442	<.001	<.001	—	
Fin R	Pearson's r	0.597***	0.115	0.157**	0.112	-0.132*	—	
	df	272	270	282	284	254	—	
	p-value	<.001	0.059	0.008	0.058	0.034	—	
Non- fin R	Pearson's r	0.219***	-0.015	-0.005	-0.009	0.227***	0.201***	—
	df	275	280	294	297	262	279	—
	p-value	<.001	0.8	0.931	0.875	<.001	<.001	—

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

The factor-score correlation matrix provides deeper insight into the structural relationships among the main constructs, particularly focusing on IFI's Decision as the principal dependent

variable. The results demonstrate that several latent factors exhibit significant positive associations with IFI's Decision, indicating that behavioural, managerial, and financial dimensions all play important roles in shaping the IFI's decision to deploy participatory modes of financing for SMEs. Just like the mean scores, the correlation of the variables for the factor scores shows similar patterns. The financial ratios ( $r = 0.597$ ,  $p < .001$ ), financial management skills ( $r = 0.506$ ,  $p < .001$ ), SME operator's willingness ( $r = 0.431$ ,  $p < .001$ ), entrepreneurial skills ( $r = 0.420$ ,  $p < .001$ ) and non-financial ratios ( $r = 0.219$ ,  $p < .001$ ), all indicate a fairly strong positive correlation with IFI's decision, while SME operator's knowledge level ( $r = -0.145$ ,  $p = .021$ ) indicate a negative correlation with IFI's decision.

In sum, the results of the correlation analysis reveal a coherent pattern, which shows that the IFI's decision to adopt participatory modes of financing is shaped largely by managerial capabilities, willingness to engage in participatory financing, and the firm's financial health, whereas knowledge alone does not necessarily drive adoption and may, in fact, contribute to caution for IFI's in their decision-making

## 6.4 SME Entrepreneur's Demographic and Firm Profile

### 6.4.1 Gender Distribution

From the analysis of the demographic data, it is evident that most research responses were obtained from male SME operators, constituting 74.3 percent of the total sample. This gender disparity is not surprising, particularly within the context of The Gambia, where men are typically considered the heads of households and bear the primary financial responsibility, as endorsed by Islamic teachings. Consequently, men are more likely to engage in entrepreneurial ventures such as small and medium-sized enterprises to provide for their families, especially in developing economies.

**Table 6.4** Frequencies of Gender

<b>Gender</b>	<b>Counts</b>	<b>% of Total</b>	<b>Cumulative %</b>
Female	80	25.7 %	25.7 %
Male	231	74.3 %	100.0 %

Generally, the tendency of women to create their own businesses is very low compared to men due to financial, cultural and other factors. This result is generally in line with many earlier studies on SMEs. For instance, from his study on evaluating the role Islamic finance in

financing SMEs in The Gambia, Jallow (2023) reported that over 77 per cent of his respondents were men. Similarly, Al Balushi et al (2018) reported that over 68.8 per cent of the respondents on their study on Islamic finance decision-making amongst SMEs in Oman were male. Furthermore, Roper and Scott (2009) found that rate of women's startup in the UK is constrained by two major factors including the general perception amongst women that they face stringent financial barriers and their unwillingness to seek external financing for their startups. Hussain et al (2006) also reported that over 78.6 per cent of their respondents were male from their study on comparing SME financing in the UK and China. Furthermore, Rita (2019) reports a 72 per cent male dominance in his research. Thus, SME literature is replete with evidence of male dominance of the SME business sector.

### 6.4.2 Age Distribution

Regarding the age distribution of the respondents, the table below shows that majority of respondents fall under the age bracket of 31 to 40 years representing 48.2 per cent of the respondents. This is followed by the age range of 41 to 50 years, which constitutes 34.4 per cent.

**Table 6.5 Frequencies of Age**

Age	Counts	% of Total	Cumulative %
20 years & below	1	0.3 %	91.3 %
21 to 30 years.	26	8.4 %	8.4 %
31 to 40 years.	150	48.2 %	56.6 %
41 to 50 years.	107	34.4 %	91.0 %
Over 50 years	27	8.7 %	100.0 %

Combined, the age groups between 31 to 50 years make up approximately 82.6 per cent of the total respondents. This finding supports the widely held notion that SME operations serve as a major source of livelihood and employment for economically active individuals in developing countries, particularly those facing structural employment challenges.

In contexts such as The Gambia, where formal employment opportunities are limited, many individuals within this age bracket often turn to self-employment and SME ventures either due to prolonged job searching, redundancy from previous employment, or the necessity of sustaining household livelihoods. These dynamics are well explained by both the Dualist Theory and the Labour Supply Theory of SME formation. According to the International

Labour Organization ILO (1970) the dualist perspective suggests that SMEs emerge as a response to the inability of the formal economy to absorb all entrants into the labour market. Similarly, Pederson (1998) and later scholars such as Matsongoni and Mutambara (2018) argue that SMEs are a natural response to underemployment and the surplus supply of labour in developing economies, particularly among the youth and middle-aged population segments. These findings reflect the socio-economic realities of many low-income nations where informal sector businesses mainly in the form of SMEs become essential coping mechanisms and vehicles for entrepreneurship.

### 5.4.3 Education Level

The table below presents the educational qualifications of the respondents in the study. The data indicates that the largest proportion of respondents that is about 42.3 Per cent had attained high school education, either having completed it or exited at some point during the high school level. This is followed by 21.2 per cent of respondents who reported university education as their highest level of qualification, and 14.3 per cent who had completed secondary education. Only 17.3 per cent of the total sample reported having no formal education, while 4.9 per cent attained primary education.

**Table 6.6 Frequencies of Education**

<b>Education</b>	<b>Counts</b>	<b>% of Total</b>	<b>Cumulative %</b>
No formal education	53	17.3 %	59.6 %
Primary education	15	4.9 %	64.5 %
Secondary education	44	14.3 %	78.8 %
High school education	130	42.3 %	42.3 %
University education	65	21.2 %	100.0 %

Collectively, these figures show that 82.7 per cent of respondents possess some form of formal education, highlighting a relatively literate SME population within the study sample. This is consistent with recent national data from The Gambia Bureau of Statistics GBoS (2024) which puts the country's overall literacy rate at 62.9 per cent. It also supports the notion that education plays a critical role in the development and sustainability of SMEs, particularly in the areas of financial management, business planning, and innovation.

These findings are in line with prior studies. For instance, Jallow (2023) in a study on Islamic finance and SME financing in The Gambia, reported that 40.2 per cent of respondents had

attained at least a first university degree. Similarly, Rita (2019) found that 37 per cent of SME respondents completed high school or vocational high school, while 47 per cent held an undergraduate degree in their respective countries. Such findings emphasise the role of educational exposure in entrepreneurial engagement, decision-making, and financial inclusion.

#### 6.4.4 Business Sector

The table below presents the distribution of research respondents across various business sectors. From the data, it is evident that retail trading dominates the SME landscape among the sample, accounting for 44.0 per cent of all respondents. This is followed by the services sector 19.1 per cent, general merchandise or mixed trading 18.4 per cent, agri-business 15.2 per cent, and manufacturing, which constitutes the smallest share at just 3.2 per cent.

**Table 6.7 Frequencies of Business sector**

<b>Business sector</b>	<b>Counts</b>	<b>% of Total</b>	<b>Cumulative %</b>
Agri-business.	47	15.2 %	15.2 %
General Merchandise (Mixed).	57	18.4 %	33.7 %
Manufacturing	10	3.2 %	36.9 %
Retail trading.	136	44.0 %	80.9 %
Services	59	19.1 %	100.0 %

The predominance of the retail sector is not unexpected within the context of The Gambia's economic structure. The country has limited local manufacturing sector, and much of the consumer goods are imported. As a result, a significant number of SMEs operate in retail, sourcing products through importers and distributing them to end consumers. The manufacturing sector, in contrast, remains underdeveloped, reflected in its minimal representation 3.2 per cent in the sample. Another notable observation is the general merchandise category, which is like retail trading, typically involves selling a wide array of consumer products. Combined, retail trading and general merchandise account for 62.4 per cent of the total SME respondents, underscoring the dominance of trading activities in the SME sector. Comparatively, studies in other contexts show different sectoral emphases. For instance, Hussain et al (2006) reported that 28.6 per cent of their SME respondents in a comparative study between the UK and China were engaged in manufacturing, a significantly higher proportion than observed in The Gambia. This highlights the developmental gap in industrial capacity and production infrastructure between The Gambia and more industrialised or

emerging economies. Hence, for the purposes analysis in this study, the business sectors are binarily classified as (retail and non-retail). The retail comprises of (retail trading and general merchandise) and non-retail comprise of (Agri-business, manufacturing and services).

### 6.4.5 Location of SMEs

The population distribution in The Gambia is highly urban-centric, with most citizens concentrated in a few key urban settlements. According to the latest census figures from The Gambia Bureau of Statistics (GBoS, 2024), the Kanifing Municipal Council and the Brikama Area Council are the two most populous urban regions and account for a combined 63.2 per cent of the national population. This urban dominance is reflected in the regional distribution of SME respondents in this study. As shown in the table below, Kanifing and Brikama together account for 81.9 per cent of all survey respondents, with 43.4 per cent from Kanifing and 38.6 per cent from Brikama.

**Table 6.8 Frequencies of Location**

Region	Counts	% of Total	Cumulative %
Banjul	6	1.9 %	1.9 %
Basse Area Council	7	2.3 %	4.2 %
Brikama Area Council	120	38.6 %	42.8 %
Janjangbureh Area Council	8	2.6 %	45.3 %
Kanifing Municipal Council	135	43.4 %	88.7 %
Kerewan Area Council	17	5.5 %	94.2 %
Mansakongko Area Council	18	5.8 %	100.0 %

This pattern supports the assertion by Al-Jebouri et al (2022) Liu et al (2023) that population density and economic activity are positively correlated, thus regions with higher populations typically attract more businesses due to demand concentration, infrastructure availability, and access to markets. The concentration of SMEs in Kanifing and Brikama is consistent with findings by Secka et al (2023), who reported that 37 per cent and 33 per cent of SME respondents in their study were in Brikama and Kanifing, respectively. Likewise, Diabate et al (2019), in their study on SME sustainability in Ivory Coast, found that over 65.6 per cent of their respondents were concentrated in Abidjan and its surrounding urban areas, again reinforcing the trend of urban concentration of small businesses in developing and middle-income countries. These findings highlight the importance of urban-based SME policy

interventions in The Gambia, particularly in these two regions. Targeted financial support, training programs, and infrastructure development in Kanifing and Brikama would likely yield the highest impact in terms of SME support and economic growth. In this study, the business locations are categorised into urban (Banjul, Kanifing and Brikama) and rural (Basse, Kerewan, Mansakongko, and Janjangbureh) for the purposes of analysis.

#### 6.4.6 Number of Employees

The number of employees is a widely adopted criterion for defining and classifying SMEs across jurisdictions, industries, and development organizations Jallow (2023). In The Gambia, the national MSME policy outlines specific thresholds to categorize firms by size. A micro-enterprise is defined as a firm employing 1 to 4 employees, with paid-in capital or assets of up to GMD 25,000 and annual sales not exceeding GMD 500,000. A small enterprise employs 5 to 15 employees, with assets between GMD 25,000 and GMD 1 million and annual sales between GMD 501,000 and GMD 2 million. Conversely, medium enterprises have 16 to 49 employees, capital of GMD 1 to 5 million, and sales between GMD 2 million and GMD 10 million, while large firms are those exceeding these thresholds in both workforce and financial metrics (MSME Policy, 2020).

**Table 6.9** Frequencies of No of employees

No of employees	Counts	% of Total	Cumulative %
1 to 5	205	65.9 %	65.9 %
6 to 10	67	21.5 %	87.4 %
11 to 15	20	6.4 %	93.8 %
16 to 20	1	0.3 %	94.1 %
Above 20	18	5.8 %	100.0 %

The results show a clear dominance of micro and small enterprises, which together constitute 87.4 per cent of the total respondents. This outcome aligns with prevailing patterns observed in developing economies, where most SMEs are owner-managed businesses with few employees. These micro and small firms often absorb unemployed graduates, school dropouts, and redundant workers seeking alternative livelihoods. Additionally, many are operated by individuals in active employment or retirees seeking supplementary income in the absence of strong social safety nets, which are typically weak or non-existent in many low-income countries such as The Gambia. The minimal representation of medium and large firms with

only 6.1 per cent employing more than 15 staff, further reinforces the view that many SMEs operate as subsistence-level ventures rather than growth-oriented enterprises. These findings underscore the urgent need for targeted policy support and capacity development to enable SMEs to scale and transition from survivalist to growth-driven models.

### 6.4.7 Ownership Structure

One of the defining characteristics of SMEs, particularly in developing and emerging economies, is their owner-managed nature. This is often due to financial constraints, limited managerial resources, and the informal structure in which many of these businesses operate. The table below provides the distribution of ownership status among the SME respondents.

**Table 6.10 Frequencies of Ownership status**

<b>Ownership status</b>	<b>Counts</b>	<b>% of Total</b>	<b>Cumulative %</b>
Managing employee	4	1.3 %	1.3 %
Owner	262	84.2 %	85.5 %
Part-Owner	45	14.5 %	100.0 %

From the results, a vast majority 84.2 per cent of the SMEs are directly owner-managed, with an additional 14.5 per cent managed by part-owners. Combined, these two categories represent 98.7 per cent of all SME respondents in the study. This finding is consistent with the structure of SMEs globally, where owners are typically deeply involved in the day-to-day operations of the business (Jallow, 2023). The owner-managed model reinforces the critical role SMEs play in employment creation. According to the (World Bank, 2022), SMEs globally account for over 70 per cent of total employment. Moreover, it is projected that by the year 2030, approximately 600 million new jobs will be required to absorb the growing global workforce and four out of every five of these jobs are expected to be created by SMEs. In the context of The Gambia, SMEs currently provide employment to over 60 per cent of the urban working population (Jallow, 2023). These findings not only affirm the importance of SMEs as engines of employment and economic resilience but also highlight the critical need for tailored support to owner-managers who shoulder the operational, financial, and strategic responsibilities of their enterprises.

### 6.4.8 Years of Business Experience

Expectedly, the figure from the below table shows that, about 39.2 per cent of the respondents indicate that, the SME business has been in operation for more than 10 years. This supports the

earliest studies results that indicated that SMEs provide the most employments across the global economies employing about 70 per cent of the global workforce irrespectively of whether the country’s economy is advanced, developing and immerging (World Bank, 2022).

**Table 6.11 Frequencies of Years of business experience**

<b>Years of business experience</b>	<b>Counts</b>	<b>% of Total</b>	<b>Cumulative %</b>
0 – 2 years	21	6.8 %	6.8 %
3 – 4 years	41	13.2 %	19.9 %
5 – 6 years	55	17.7 %	37.6 %
7 – 8 years	32	10.3 %	47.9 %
9 – 10 years	40	12.9 %	60.8 %
Above 10 years	122	39.2 %	100.0 %

Furthermore, much research works on SME financing have concluded that firm age is positively correlated with access and availability of finance to the SME firm. Cumulatively, the SME businesses that have been in operations for five years above account for over 80.1 percent of the total respondents in this research. This again is a solid testament that majority of the participating SMEs have been in existence for a while.

## **6.5 Conclusion**

This chapter has presented and analysed the empirical characteristics of the study variables using descriptive statistics, frequency distributions, and correlation matrices based on both mean scores and factor scores. The results offered a comprehensive overview of the demographic and structural profiles of the participating SMEs, including firm age, sector, size, ownership status, respondent demographics, and skill levels. These findings highlight the diversity of the SME landscape, revealing considerable variation in experience, education, financial leverage, and managerial capacity. The analysis also examined key psychometric variables such as trust, entrepreneurial skills, financial management skills, knowledge of Islamic finance principles and products, and willingness to use participatory modes. Collectively, the findings in this chapter establish a solid empirical foundation for the subsequent examination of causal relationships and predictive modelling.

## **CHAPTER 7**

# **PROMOTING THE USE OF THE ISLAMIC PARTICIPATORY MODES OF FINANCING FOR SMES: A PSYCHOMETRIC ANALYSIS**

### **7.0 Introduction**

The chapter carries on with the empirical examination and analysis of the research data. The initial analysis which seeks to examine the relationship between a psychometric measurement of the identified research independent variables with the dependent variable. Moving on to the main analysis of running multiple models of regressions to estimate the strength and the direction of the relationships between the variables. The chapter ends with summary of the keys results.

### **7.1 Psychometric Analysis with Multiple Regression**

#### **7.1.1 Analysis of Some Psychometric Properties**

##### **7.1.1.1 Reliability Analysis**

As highlighted earlier, the reliability of a measuring instrument is the ability of the instrument to produce consistent results over repeated administration (Sarira et al, 2020). According to McDowell and Newell (1996) the reliability of a scale is concerned with the error in measurement. Thus, reliability assesses the extent to which a score is free from random error, as it is assumed that there will always be a degree of random error in the administration of a measurement scale (Bannigan and Watson, 2009). A random error has been defined as ‘the proportion of observed variation in scores’ (McDowell and Newell, 1996). Therefore, the lesser the variations an instrument produces in the attributes from repeated administration, the higher its reliability (Polit and Hungler, 1995).

The extant literature has revealed different forms of assessing the reliability of a measuring scale and some of the commonly used ones include internal consistency commonly understood as Cronbach’s alpha, test-retest and equivalence amongst others. Internal consistency is arguable one of the most widely used method of testing the reliability of a scale. These techniques of reliability testing seek to assess as how well a group of items measure the same

characteristic, i.e., a group of items measuring the different aspects of the same concept or variable (Utwin, 1995 p.6). The reliability of a scale through the Cronbach's Alpha values is best calculated at individual variable levels rather than a collective Alpha value of the total variables in a scale. The below diagrams show the scale reliabilities of the research variables.

**Table 7.1 Scale Reliability Statistics**

<b>Variables</b>	<b>Cronbach's <math>\alpha</math></b>	<b>McDonald's <math>\omega</math></b>	<b>Number of items</b>
Firm Performance	0.87	0.9	6
Knowledge and understanding	0.94	0.94	10
Willingness of SMEs	0.82	0.87	7
Trust	0.88	0.89	11
Entrepreneurial skills	0.93	0.93	15
Financial Management skills	0.89	0.9	12

Amongst the variety of methods of testing for the internal consistency of an instrument, Cronbach's alpha is the most popular (Bannigan and Watson, 2009). As Nunally (1967) reports, Cronbach's alpha is the best estimate of reliability as many errors in measurement instruments emanate from their contents. According to Hair et al (1998), 0.70 is the acceptance level for Cronbach Alpha. From the above Alpha values, it could be seen that the lowest value of all the Alpha values is 0.82 (SME willingness), which is even far above the acceptable level of 0.70, while the highest 0.94 is quite close to 1, which is the maximum Alpha value obtainable. As a matter of fact, all the Alpha values of the variables are 0.8 and above, indicating a very high reliability. Thus, based on the above Alpha values, it is evident and quite appropriate to conclude that, the items and dimensions used in the measurement of the research variables are indeed the right ones. Furthermore, (Sekaran and Bougie, 2010) stressed that the values of Cronbach Alpha closer to 1 show high consistency of the measuring instrument. Thus, the reliability of the variables in the scale is satisfactory.

### **7.1.1.2 Validity**

As indicated in the methodology, the validity of a measuring scale is the measure of how well the instrument measures what it intends to measure. Validity according to Messick (1989) is 'an integrated evaluative judgement of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on test scores. Carmines and Zellar (1979) indicate that validity is not an absolute thing but rather a

matter of degree and thus, it is not an ‘all or nothing concept’. The validity of a measuring scale is concern with the meaning and interpretation of the scores generated by the scale (Tabachnick and Fidell, 2007).

Construct validity is the main form of validation of a test. In the absence of a gold standard or an existing reference point or criteria, the validity of a scale could be tested by assessing ‘to what extent the measurement scale under development correlates with the construct under investigation’ (Polit and Hungler, 1995). The procedure of testing construct validity begins with defining the topic or constructs to be measured (McDowell and Newell, 1996) and may be expressed also as hypotheses, indicating what correlations are expected. Construct validity is part science and part arts and cannot be proven definitively i.e., ‘it is a continuing process in which testing contributes to understanding of the construct (McDowell and Newell, 1996). The features of a good study of construct validity includes, stating clearly the hypothesis and the justifications, testing the hypotheses and commenting on the results. Construct validity could be assessed through convergent validity, factorial validity or discriminant validity.

Factor analysis is mainly used in the field of psychology and education, and it is the method of choice for self-reporting questionnaires (Hogarty et al, 2005; Byrant et al, 1999). Thompson (2004) citing Nunnally (1978) stated that ‘factor analysis is intimately involved with the question of validity, and factor analysis is at the heart of the measurement of psychological constructs. An exploratory factor analysis is an unrestricted measurement model that does not require a priori specification (Kline, 2016). It is a method that is used to determine the underlying structure of the scale and is useful in the exploration of the hidden characteristics of a measurement instrument (Sarira El-Den et all, 2020). Fabrigar and Wegener (2012) stated that ‘when the goal of research is to identify latent constructs for theory building or to create measurement instruments in which the researcher wishes to make the case that the resulting measurement instrument reflects a meaningful underlying construct, we argue that common factor analysis (EFA) procedures are usually preferable’. Thus, factor analysis provides construct validity evidence of self-reporting scales (Williams et al, 2010 ; Awais et al, 2024). As the main form of validity check for this research instrument, the researcher conducted factor analysis on the research data to determine the factorial distribution of the data and to help identify which of the construct items might not be very useful in its measurement hence deleted before proceeding with further analysis. However, before the researcher runs the factor analysis, the data were first checked for their suitability for factor analysis.

The debate on the sample size adequate for factor analysis is still unsettled in the literature. Tabachnick's rule of thumb suggests that at least 300 cases are needed for factor analysis (Tabachnick, 2007). In contrast, Hair et al (1995) suggest that the sample size for factor analysis should be 100 or more. Meanwhile, cited various textbooks, Comrey (1973) postulates the guidelines for sample size in factor analysis that, 100 cases are considered poor, 200 fair, 300 as good, 500 as very good 1000 and more as excellent. While Sapnas and Zeller (2002) point out that, even 50 cases may be adequate for factor analysis.

In this research, the number of cases is 304, thus fairly falls within the acceptable sample size for factor analysis to be carried out. Again, prior to conducting factor analysis, amongst the many tests that needed to be carried out includes Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy Kaiser et al (1974) and Bartlett's Test of Sphericity Bartlett (1950) to determine whether the correlation metrics support EFA. KMO index ranges from 0 to 1, and a KMO value of 0.80 is considered meritorious hence suitable for factor analysis Kaiser et al (1974). The Bartlett's Test of Sphericity helps to verify that the overall correlation between the variables is strong enough to justify factor analysis. Meanwhile the Bartlett's Test of Sphericity should be significant at 0.05 for factor analysis to be suitable (Tabachnick and Fidell, 2007). In this research, the Bartlett's Test of Sphericity is significant as indicated in the diagram below, while the overall (KMO) Measure of Sampling Adequacy was 0.84 which is considered by Kaiser et al (1974) as meritorious for factor analysis.

**Table 7.2 Bartlett's Test of Sphericity**

$\chi^2$	df	P
9534.47	1830	< .001

The above results provide evidence that the research data is suitable for factor analysis. Exploratory factor analysis techniques of maximum likelihood (ML) and principal axis factoring (PAF) are very suitable for exploring the underlying factors and producing meaningful interpretation. In this research, the principal axis factoring together with oblique method of rotation have been utilised since the factors are believed to be related as the case is in social science research especially in psychometrics. Common factor analysis was selected instead of principal component analysis because the intention is to identify the latent factor structure (Fabrigar et al, 1999).

### 7.1.1.3 Factor Analysis

The table below shows the results for the initial run of exploratory factor analysis on the research data to help identify which items of the factors load appropriately on the specific factors and which ones have cross loadings or insufficient loadings. The software was instructed to only produce the factor loadings of 0.5 and above, as well as limit the number of factors extracted to six (6). It must be noted that there is no agreement amongst researchers on the optimal cut-off point for factor loading, however, 0.04 and 0.45 seem to be widely accepted in the literature (Hair et al, 1995; Tabachnick and Fidell, 2007). Thus, a cut-off point of 0.05 in this research demotes higher validity evidence.

**Table 7.3 Factor Loadings**

Items	1	2	3	4	5	6	Uniqueness
P1							0.698
P2					0.756		0.287
P3					0.842		0.221
P4					0.881		0.204
P5					0.856		0.287
P6					0.797		0.392
K1							0.738
K2	0.576						0.532
K3	0.615						0.508
K4	0.912						0.211
K5	0.912						0.139
K6	0.89						0.249
K7	0.885						0.15
K8	0.94						0.128
K9	0.934						0.105
K10	0.82						0.267
W1							0.836
W2				0.653			0.526
W3				0.749			0.387
W4				0.75			0.424
W5				0.774			0.354

W6		0.739	0.417
W7		0.573	0.641
T1			0.79
T2			0.502
T3			0.51
T4			0.554
T5			0.754
T6			0.577
T7			0.807
T8			0.696
T9			0.612
T10			0.534
T11			0.856
EP1			0.623
EP2	0.519		0.509
EP3	0.643		0.545
EP4	0.657		0.504
EP5			0.614
EP6			0.778
EP7	0.645		0.517
EP8	0.697		0.464
EP9	0.726		0.439
EP10	0.773		0.389
EP11	0.579		0.61
EP12	0.548		0.557
EP13	0.804		0.385
EP14			0.591
EP15	0.655		0.579
FM1		0.596	0.586
FM2		0.57	0.573
FM3		0.615	0.57
FM4		0.628	0.611
FM5		0.542	0.625

FM6		0.722
FM7	0.724	0.44
FM8	0.528	0.614
FM9	0.595	0.556
FM10	0.627	0.53
FM11	0.56	0.627
FM12	0.573	0.578

Note. ‘Principal axis factoring’ extraction method was used in combination with an ‘oblimin’ rotation *Note:* P (firm performance), K(Knowledge), T(Trust), EP (Entrepreneurial skills), and FM (Financial management skills).

Based on the 0.05 cut-off points, the items 1 of firm performance P1, knowledge and understanding K1, willingness W1, trust T1, and entrepreneurial skills EP1, have all not loaded on any factor. Similarly, items T5, T7 and T8 of trust, EP5, EP6 and EP14 of entrepreneurial skills and FM6 of financial management skill variables have not all also loaded on any factor. As a result, all these items that did not load on any factor because of the 0.5 cut-off point were deleted and excluded in the further analysis. There was no case of cross-loading since the Software was forced to produce a maximum of six (6) factors, thus all the items with loadings of 0.5 and above must load on a specific factor. These items were deleted and exploratory factor analysis re-run. When the data was re-run after the initial deletions, it was found that items 4 and 11 of trust variable T4 and T11 as well as items FM8, FM10, FM11 and FM12 of the financial management skills did not subsequently load on any factor. They were deleted and further analysis was conducted on the remaining items. After the second re-run, it was realised that items FM5 and FM9 in the financial management skill variable also needed to be deleted for lack of loading on any factor. The results after deletion are presented below.

**Table 7.4 Factor Loadings**

Items	1	2	3	4	5	6	Uniqueness
K8	0.94						0.13
K9	0.93						0.11
K5	0.92						0.14
K7	0.89						0.16
K4	0.88						0.24
K6	0.87						0.27
K10	0.83						0.26

K3	0.59			0.52
K2	0.57			0.53
EP10		0.81		0.32
EP13		0.8		0.39
EP9		0.76		0.39
EP8		0.72		0.47
EP15		0.66		0.56
EP4		0.64		0.51
EP7		0.63		0.52
EP11		0.58		0.58
EP3		0.55		0.63
EP12		0.52		0.6
EP2		0.51		0.48
W5			0.84	0.29
W6			0.82	0.29
W4			0.78	0.39
W3			0.75	0.38
W2			0.66	0.48
W7			0.61	0.59
P4			0.89	0.18
P5			0.88	0.24
P3			0.83	0.23
P6			0.81	0.37
P2			0.71	0.33
FM1			0.77	0.38
FM3			0.73	0.44
FM7			0.71	0.41
FM4			0.7	0.5
FM2			0.61	0.51
T9			0.78	0.38
T10			0.62	0.51
T2			0.57	0.55
T6			0.56	0.6

Note. 'Principal axis factoring' extraction method was used in combination with an 'Oblimin' rotation *Note*: P (firm performance), K(Knowledge), T(Trust), EP (Entrepreneurial skills), and FM (Financial management skills).

From the above table 7.4, it could be seen that variable (Knowledge and understanding 'K') variable have been eventually measured by 9 items instead of the initial 10 items on the questionnaire with the 0.05 cut-off criterion of factor loadings. Similarly, variable 2 (entrepreneurial skills 'EP') variable was measured by 11 items instead of the 15 items on the questionnaire. By the same token, variable 3 (willingness of SMEs to use Islamic participatory modes 'W'), was measured by 6 items instead of 7, variable 4 (firm performance 'P'), variable 5 (financial management skills 'FM'), and variable 6 (trust 'T') were all measured by 6 items, 5 items, 5 items and 5 items instead of 7 items, 6 items, 12 items and 11 items respectively on the research questionnaire. At minimum, 5 items have been retained to measure each of the factors. McEvily and Tortorriello (2011) opine that a psychometric measurement of a construct requires the use of multiple items covering different dimensions of the construct. Meanwhile, Sarira El-Den et al (2020) indicate that a minimum of 3 items is needed for the measurement of a latent or psychological construct. Similarly, methodologists such as MacCallum et al (1999) Velicer and Fava(1998) have recommended that at least 3 to5 items be included for a factor in a study. In this research, the minimum number of items measuring a factor is 5 while 11 items represent the maximum. This yet again represents another level of validity evidence for the scale.

**Table 7.5 Summary of total variance explained**

<b>Factor</b>	<b>SS Loadings</b>	<b>% of Variance</b>	<b>Cumulative %</b>
Knw & Und	6.6	16.11	16.11
Entrp Skills	5.1	12.44	28.55
Wln	3.78	9.21	37.76
Prfm	3.6	8.77	46.53
FM Skills	2.93	7.14	53.67
Trust	2.49	6.06	59.73

From the factor summary table 7.5 above, the results indicate that factor 1 labelled as (knowledge and understanding of Islamic finance principles and products), comprising of 10 items, accounts for about 16.11 per cent of the total variance explained in the data by the factor.

Factor 2, which seek to measure the entrepreneurial skills of the SME client, accounts for about 12.44 per cent of the total variance with 11 items. It is pertinent to note that, the amount of variance accounted for by a factor is not determined by the number of items in the factor, instead it is influenced by the strength of the loadings of the individual items on the factor. Likewise, factors, 3, 4, 5, and 6 accounted for 9.21 per cent, 8.77 per cent, 7.14 per cent and 6.06 per cent respectively. Collectively, the six factors accounted for about 59.73 per cent of the total variance.

**Table 7.6 Model Fit Measures**

RMSEA	RMSEA 90% CI		TLI	BIC	Model Test		
	Lower	Upper			$\chi^2$	df	p
0.07	0.06	0.07	0.85	-1956.91	1266.26	589	< .001*

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

From the model results, the Root Mean Square Error of Approximation (RMSEA) provides an estimate of the discrepancy between the hypothesised model and the observed data, adjusted per degree of freedom (Fabrigar et al, 1999). RMSEA values less than 0.05 are generally considered a good model fit, while values between 0.05 and 0.08 suggest an acceptable fit (Brownen and Cudeck, 1989). In this study, the RMSEA value was 0.07, placing it within the acceptable range, thus suggesting that the model fits the data reasonably well. In addition, the overall model test was statistically significant, supporting the adequacy of the model structure. Although the model demonstrates a moderate to marginal fit, it is important to note that both the RMSEA and its confidence interval fall within acceptable thresholds. However, the Tucker-Lewis Index (TLI) may benefit from further refinement, as minor improvements in model specification could enhance overall fit (Kenny et al, 2015; Marsh et al, 2004; Wheaton et al, 1977).

## 7.2 Multiple Regression Analyses

A multiple regression method of data analysis uses more than one predictor or independent variable to evaluate their relationship and impact on the predicted or dependent variable (Tabachnick and Fidell, 2019). It is the measurement of the relative influence of each independent variable on the dependent variable (Field, 2018). Multiple regression works on the assumption that there is a linear relationship between the dependent variable and each of the independent variables and that there is no major correlation between the independent variables which is known as multicollinearity (Conteh, 2020; Field, 2018). In this research, the aim is

to evaluate the potential role of psychometrics and data mining in promoting the use of Islamic participatory modes of financing for SMEs by IFIs. Thus, the decision of IFIs to use the Islamic participatory modes of financing as the research dependent variable has been evaluated using a three-step process. The outcome of the first two steps process is used in an index as a proxy measurement for the decision of IFIs to use Islamic participatory modes for SMEs, and it includes.

- i. Establishing the financial performance or profitability of the prospective client or project.
- ii. Operator Trustworthiness (addressing the impending moral hazard issues in performance reporting).
- iii. Decision of the IFIs to use the participatory modes base on the inferences drawn from the first two steps.

### **7.3 Assumption Checks for Multiple Regression**

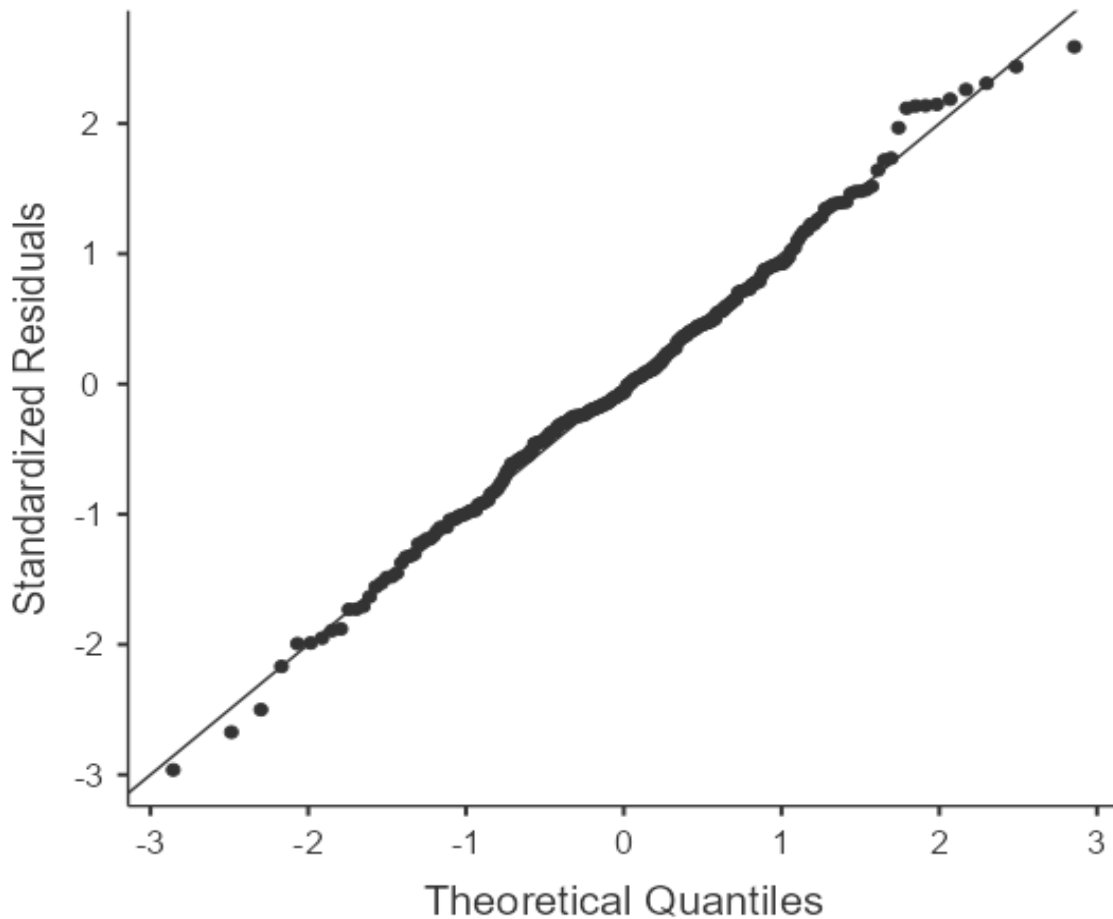
Checking assumptions is crucial to ensuring the validity of statistical analyses. Statistical analyses are conducted on the back of many underlying assumptions, and the violation of these assumptions can cause various issues like statistical errors and biased estimates (Shatz, 2024). The effects of these statistical errors and biases on the research results range from inconsequential to critical (Erns and Albers, 2017; Hu and Plonsky, 2021). Thus, it is wise and recommended, to evaluate the underlying assumptions of statistical methods when using them (Hox et al, 2018). One of the key assumptions that underpin many statistical tests is the normality of the distribution in the data residuals (Neter et al, 2005). There are both graphical (i.e., Q-Q plot, histogram) and numerical (i.e., Shapiro-Wilk test) methods of testing for the normality assumption of a dataset (Yang and Berdine, 2021). Under the multiple regression analysis for this study, the two main assumption checks were conducted before further analysis including normality test by using Q-Q plot and collinearity or multicollinearity test for the ‘independentness’ of the predictor variables in terms of their unique contributions to the overall variance explained was checked by examining the numerical values of the variance inflation factor (VIF) and tolerance.

#### **7.3.1 Q-Q Plot**

The Q-Q plot is one of the widely used graphical methods of testing for the normality distribution assumption of a dataset. Unlike the Shapiro-Wilk test, which is most ideal for a

smaller sample, Q-Q plot requires a larger sample to provide reliable information (Neter et al, 2005).

**Figure 3 Q-Q Plot**



In a Q-Q plot, the observed quantiles (standardised residuals) from the data are plotted against the theoretical quantiles (hypothesised quantiles), and when the observed data fits the theoretical quantiles, then a roughly straight line emerges as a suggestion of the normality of the residuals. The Q-Q plot visually indicates a correlation between the data (observed residuals) and the normal quantiles like 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 100<sup>th</sup>; and it measures how well data are modelled by a normal distribution. From the diagram above, it could be observed that the black dots representing the residuals of the data roughly formed a straight line around the  $Y = X$  line as a reference point of measurement, thus, this appearance of the dots in the form of a straight line provides evidence that the residuals from our research dataset are normally distributed.

### 7.3.2 Multicollinearity

The basic assumption of using more than one independent variable in a multiple regression is the notion that each of the variables has a unique contribution to the overall variance explained in the dependent variable. However, when two independent variables are heavily correlated, this supposed unique contribution is lost. Two variables are said to be collinear when they measure the same attribute of an object or construct (Kock and Lynn, 2012). Hence, a major correlation between the two independent variables is suggestive of the redundancy of one of the variables (Awais et al, 2024). Collinearity is also sometimes called multicollinearity, and according to (Alin, 2010) it describes a situation in a statistical model in which two independent variables are linearly related. When two independent variables are highly correlated, the effect of the variables individually cannot be clearly separated.

**Table 7.7 Collinearity Statistics**

<b>Variables</b>	<b>VIF</b>	<b>Tolerance</b>
Firm Age	2.28	0.44
Business sector	1.21	0.83
Business location	1.15	0.87
No. of employees	1.31	0.77
Gender	1.16	0.87
Ownership status	1.25	0.80
Respondent's age	1.25	0.80
Years of business experience	2.14	0.47
Education level	1.14	0.88
Solvency ratio	2.6	0.39
Operating leverage ratio	3.3	0.30
Financial leverage ratio	2.78	0.36
Trust	1.55	0.64
Entrepreneurship skills	1.33	0.75
Financial Management skills	1.36	0.73
Willingness of SMEs	1.36	0.74
Knowledge level	1.47	0.68

The collinearity between independent variables is popularly assessed using the variance inflation factor VIF (Field, 2005). When the value of tolerance is less than 0.2 or 0.1 and at the

same time the value of VIF is 10 and above, then there is a problem of multicollinearity (Dahiyat et al, 2021; Hair et al, 2018). There is no single threshold value for testing collinearity from literature. However, some of the reported threshold's values include 3.3, 5, and 10 (Hair et al, 2009; Kline, 1998; Cenfetelli and Bassellier, 2009). The above table presents the VIF values of the independent variables in this research. As could be seen, all the VIF values are below the lowest threshold values of 3.3 reported in the literature. Hence, there is no case of collinearity or redundancy for any of the independent variables in the regression models. This means that each of the independent variables provide information about the dependent variable which is not given by any of the other independent variables or their combination.

## **7.4 Screening Process with Regression for IFIs use of the Participatory modes for SMEs**

### **7.4.1 Step 1: Establishing the financial performance**

Unlike conventional plain-vanilla loan products, the Islamic participatory modes of financing serve as investment-based instruments through which the Islamic Financial Institutions maintain direct exposure to both the potential gains and losses of the underlying ventures. Given that the returns on these financing modes are theoretically tied to the actual performance of the financed firm, IFIs prioritise establishing the financial viability of the investment opportunity as a critical first step in their financing decision-making. In this study, this preliminary evaluation phase has been assessed through the application of Models 1 and 2, which aim to examine the viability and performance potential of the underlying business ventures in line with the risk-sharing principles of Islamic finance with the below regression equations.

#### **Model 1**

From the below empirical model, the dependent variable (firm performance) and the predictor variables are discussed.

$$Y1 = \beta_0 + \beta_1x_1 + \beta_2x_2 - - - - - + \beta_{12}x_{12} + u$$

Financial performance reflects the overall financial health of a company and is a key area of interest for stakeholders, particularly shareholders and potential investors (Kiplagat, 2020). In the context of these model, firm performance which is the dependent variable has been assessed using objective financial indicators rather than psychometric latent constructs. Specifically, the Return on Equity (ROE) and Return on Assets (ROA) were employed as firm performance

measures. These two indicators are widely recognised in the literature as reliable and commonly used proxies for evaluating firm profitability and overall financial success (Michelberger, 2016; Stiglbauer, 2010). The models incorporate a range of predictor variables grounded in prior empirical research. These include, firm age, business sector, business location, number of employees, ownership status, respondent's age, years of business experience, education level, solvency ratio, operating leverage ratio, financial leverage ratio, and gender. These variables have been previously identified as having potential influence on firm performance (Bozec and Bozec, 2010; Broberg et, 2010; Munisi and Randøy, 2013; O'sullivan and Abela, 2007; Davila, 2005; Länsiluoto et al, 2019).

**Table 7.8 Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
1	0.88	0.77	0.76	73	12	261	<.001*

Note. Models estimated using sample size of N=274

The table above presents the model fit statistics from the regression analysis. The correlation coefficient (R) which measures the strength and direction of the linear relationship between the dependent and independent variables, was found to be 0.88. This indicates a strong positive correlation between firm performance (the dependent variable) and the set of independent variables, which include firm age, business sector, business location, number of employees, ownership status, respondent's age, years of business experience, education level, and the three key financial ratios including solvency (firm's ability to meet long-term obligations), operating leverage (firm's ability to increase operating income by increasing revenue or sales) and financial leverage (firm's ability to use borrowed funds to increase firm value). The adjusted R<sup>2</sup> value of 0.76 represents the coefficient of determination, which indicates that 76 per cent of the variance in firm performance is collectively explained by these predictor variables. This high explanatory power suggests that the model is robust in accounting for the variation in firm performance based on the selected firm characteristics and financial indicators. The ability of these independent variables to explain such a substantial proportion of the variance in firm performance underscores their relevance and appropriateness in measuring the construct of financial performance within the context of this study.

**Table 7.9 Model Coefficients - Firm performance**

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept <sup>a</sup>	-0.7	0.53	-0.13	0.90	
Firm Age	0.01	0.02	0.64	0.52	0.03
Business sector	-0.02	0.17	-0.12	0.90	0.00
Business location	-0.36	0.20	-1.77	0.08**	-0.06
No. of employees	-0.08	0.08	-0.95	0.34	-0.03
Ownership status	0.22	0.20	1.07	0.29	0.04
Respondent's age	0.09	0.10	0.88	0.38	0.03
Years of business experience	0.04	0.06	0.68	0.50	0.03
Education level	0.11	0.06	1.85	0.07**	0.06
Solvency ratio	0.56	0.04	13.52	<.001*	0.60
Operating leverage ratio	0.32	0.06	5.63	<.001*	0.30
Financial leverage ratio	0.01	0.05	0.23	0.82	0.01
Gender:					
1 – 0	0.34	0.17	1.94	<0.05*	0.14

Note. \* p < .05, \*\* p < .01, \*\*\* p < .001

Unlike the R squared in the model fit measure which explains the collective impact of the independent variables on the dependent variable, the standardised estimates values in the model coefficients table above show the impacts of the individual independent variables on the dependent variable. From the table, the intercept -0.7 denotes that the value of the dependent variable when all the independent variables are held at zero. In order words, firm performance value will be at -0.7 or -.07 per cent when all the predictors all held at zero. From the table, the independent variable with the biggest impact on the dependent variable is solvency ratio with a standardised estimate of 0.60. The standardised estimate value of 0.60 indicates that, for very one unit of change (increase) in solvency ratio, firm performance will increase by 0.60 or 60 per cent.

Again, from the scandalised estimate figures above, operating leverage ratio is the second highest contributing independent variable to the variance in the dependent variable with a value of 0.30 or 30 per cent. Similarly, a unit increase in the entrepreneur's educational level, ownership status, respondent's age, years of business experience, age of the firm, and financial leverage ratio, will result into 0.06, 0.04, 0.03, 0.03, 0.03 and 0.01 percents increase in firm

performance respectively. Conversely, business location, the number of employees of the firm both have a negative relationship with firm performance. This means for any unit change in the location of the business (i.e., urban to rural) and a unit increase in the number of employees, firm performance will be reduced by 0.06 and 0.03 per cents respectively. Meanwhile, the business sector of the firm (i.e., retail or non-retail) shows no impact on the firm performance. Expectedly, the gender variable shows a statistically significant effect on firm performance with a standard coefficient of 0.14 per cent. This means that the male SME entrepreneurs are 0.14 per cent more likely to have a positive impact on firm performance than female entrepreneurs. The significance of the relationship confirms the hypothesis that gender-based variations in access to resources, entrepreneurial behaviour, networking patterns can translate into measurable differences in firm outcomes.

Statistically, from the independent variables, solvency ratio and operating leverage ratio and the gender, all have a positive and significant relationship with firm performance. This means that the variables make statistically significant unique contributions in explaining the outcome of the firm performance as the dependent variable. However, educational level of the SME entrepreneur, firm age, ownership status, respondents age, years of business experience, financial leverage ratio, all have positive linear relationship with firm performance but are all not statistically significant at 5 per cent.

**Model 2**

Firm performance remains to be the dependent variable in the below empirical model, while some more predictors are added as discussed below.

$$Y_2 = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_{17}x_{17} + u \text{ Model}$$

In this model, the psychometric (latent) variables have been integrated alongside the earlier predictors to assess their combined impact on firm performance. These latent constructs represent the core qualitative dimensions of the study, and they include SME operator’s trust, entrepreneurial skills, financial management skills, knowledge level on the Islamic finance principles and products, and the willingness of SME entrepreneurs to adopt Islamic participatory financing modes. The inclusion of these constructs enables a more holistic evaluation of firm performance by combining both quantitative (e.g., solvency ratio, firm age) and qualitative (psychometric) dimensions. This approach allows for a more comprehensive understanding of how both hard financial indicators and softer behavioural and attitudinal factors influence firm performance. Additionally, the model provides insights into the relative

contribution of each set of predictors, thereby offering a more nuanced interpretation of the drivers of SME success, particularly in contexts where Islamic finance is relevant.

**Table 7.10 Model Coefficients - Firm performance**

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept <sup>a</sup>	0.37	0.92	0.40	0.69	
Firm Age	0.02	0.02	1.25	0.21	0.06
Business sector	0.03	0.17	0.16	0.87	0.01
Business location	-0.22	0.21	-1.06	0.29	-0.03
No. of employees	-0.05	0.08	-0.65	0.52	-0.02
Ownership status	0.13	0.20	0.66	0.52	0.02
Respondent's age	0.12	0.10	1.17	0.25	0.04
Years of business experience	0.10	0.06	1.66	0.10**	0.07
Education level	0.05	0.06	0.80	0.43	0.03
Solvency ratio	0.52	0.04	12.33	<.001*	0.57
Operating leverage ratio	0.29	0.06	5.13	<.001*	0.27
Financial leverage ratio	0.03	0.05	0.51	0.61	0.02
Gender:					
1 – 0	0.19	0.17	1.09	0.28	0.08
Trust	-0.04	0.18	-0.22	0.82	-0.01
Entrepreneurship skills	0.08	0.13	0.60	0.55	0.02
Financial Management skills	0.28	0.11	2.64	<0.01*	0.09
Willingness of SMEs	-0.13	0.12	-1.12	0.26	-0.04
Knowledge level	-0.83	0.20	-4.21	<.001*	-0.15

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

From the regression results presented in the table 7.10, it is evident that the inclusion of psychometric latent variables in the model has influenced the standardised coefficients of several predictors. This change indicates that the addition of qualitative factors introduces additional explanatory power, affecting the relative strength of the relationships between the independent variables and firm performance. Specifically, the standardised coefficients for years of business experience, firm age, respondent's age, financial leverage ratio, business sector, have all increased following the inclusion of the qualitative variables from 0.03, 0.03, 0.03, 0.01, and 0.00, respectively, to 0.07, 0.06, 0.04, 0.02, and 0.01. In the same vein,

coefficients of business location and number employees also improved from -0.06 and -0.03 to -0.03 and -0.02 respectively. This suggests that, with the added latent variables, the impact of these demographic and financial structural factors on firm performance becomes more pronounced for instance, a unit increase in years of business experience is now associated with a 7 per cent increase in firm performance, compared to 3 percent in the earlier model. Conversely, several variables experienced a decline in their standardised coefficients after the inclusion of qualitative predictors. For instance, ownership status decreased from 0.04 to 0.02, education level reduced from 0.06 to 0.03, solvency ratio declined from 0.60 to 0.57, operating leverage ratio declined from 0.30 to 0.27. These reductions indicate that part of the explanatory power previously attributed to these variables is now accounted for by the latent psychometric factors. Overall, these shifts in the coefficients reinforce the value of a comprehensive modelling approach that combines both quantitative and qualitative dimensions. The qualitative variables not only enhance the overall model fit but also provide deeper insight into the contextual and behavioural factors that influence SME performance.

The analysis of the added psychometric latent variables reveals that financial management skills and entrepreneurial skills both exhibit positive relationships with firm performance. However, while the relationship is statistically significant for financial management skills, it is not statistically significant for entrepreneurial skills, despite the positive direction of the effect. Interestingly, the other three psychometric constructs, trustworthiness of the SME entrepreneur, willingness of the SME entrepreneur to adopt Islamic participatory financing modes, and knowledge level of the SME entrepreneur on the Islamic finance principles and products, all show a negative relationship with firm performance in this model. These findings suggest that, in the context of the sampled SMEs, these qualitative factors may not translate directly into improved financial outcomes, and in some cases may even be associated with lower performance levels. Considering all predictors in Model 2, the variables that show a statistically significant positive relationship with firm performance are solvency ratio, operating leverage ratio and financial management skills. On the other hand, the knowledge level of the SME entrepreneur is found to have a statistically significant negative relationship with firm performance. This counterintuitive result may suggest that theoretical knowledge of Islamic finance, in the absence of practical application or institutional support, does not necessarily translate into better business outcomes.

**Table 7.11 Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
1	0.89	0.80	0.78	71.2	12.00	220	<.001*
2	0.90	0.82	0.80	60.1	16.00	216	<.001*

Note. Models estimated using sample size of N=233

The table above presents a comparative analysis of Model 1 and Model 2, highlighting the effect of incorporating qualitative (psychometric) variables into the firm performance model. In Model 1, which includes only quantitative predictors, the coefficient of correlation R was 0.89, the coefficient of determination (R<sup>2</sup>) was 0.80, and the adjusted R<sup>2</sup> was 0.79. These values indicate a strong relationship and a high level of explanatory power based on quantitative variables alone. However, after the inclusion of psychometric latent variables in Model 2, all the three model fit indicators showed improvement, as the R value increased to 0.90, the R<sup>2</sup> rose to 0.82, and the adjusted R<sup>2</sup> increased to 0.80. These increments, though modest, provide empirical evidence that the addition of qualitative variables contributes additional explanatory value to the model. This enhancement in the model performance suggests that psychometric constructs such as trust, entrepreneurial and financial management skills, knowledge of Islamic finance, and willingness to adopt Islamic participatory modes provide valuable complementary insights into the determinants of firm performance. Therefore, their inclusion enriches the overall analysis and supports the view that a combined approach incorporating both quantitative and qualitative factors is more robust for understanding SME performance.

#### **7.4.2 Step 2: Operator Trustworthiness (addressing the impending moral hazard issues)**

One of the primary deterrents to the widespread adoption of the Islamic participatory modes of financing by Islamic Financial Institutions lies in the persistent challenge of managing the associated moral hazard. In financing structures such as the participatory modes, returns to the IFIs are directly linked to the actual reported profits of the financed enterprise. While these models are inherently Shariah-compliant and promote equity in theory, they also expose IFIs to a heightened level of moral hazard risk, arising from issues such as information asymmetry, non-enforceable contracts, and the absence of robust post-disbursement monitoring mechanisms. In this context, trust emerges as a critical construct, serving as a proxy for assessing or managing potential moral hazard in Islamic participatory financing arrangements.

A trustworthy entrepreneur is more likely to disclose accurate financial information, act in good faith, and uphold their obligations, which are critical attributes that are essential in mitigating risk under profit-and-loss sharing contracts.

One of the novelties of this study lies in its attempt to explore how psychometric assessments can be applied to address among other things the moral hazard concerns within the Islamic participatory financing. By psychometrically measuring key behavioural variables and classifying applicants based on their scores, the study proposes a robust screening mechanism that could facilitate the wider application of the Islamic participatory financing modes. This phase of the research is operationalised through Models 3 and 4, which focus on both non-financial and financial predictors of trust, positioning trust as an early-stage indicator for assessing the risk of moral hazard. This aims to inform IFIs on how to integrate psychometric profiling into credit assessment processes, thereby promoting the responsible and scalable use of Islamic participatory financing instruments. The empirical models are found below.

### **Model 3**

From the below empirical model, SME operator trustworthiness (dependent variable) has predicted by psychometric variables as discussed below.

$$Y_3 = \beta_0 + \beta_{14}x_{14} + \beta_{15}x_{15} + \beta_{16}x_{16} + \beta_{17}x_{17} + u$$

For practical and analytical purposes, moral hazard issues inherent in the Islamic participatory financing arrangements have been operationalised using the trustworthiness of SME operator as a proxy for the dependent variable. This approach is informed by the recognition that trustworthiness of the entrepreneur plays a pivotal role in mitigating the information asymmetry and the associated risks of opportunistic behaviour in profit-and-loss sharing contracts such as the Islamic participatory modes. In this model, only psychometric (qualitative) variables which also constitute the core constructs of this study were employed as predictors. These include entrepreneurial skills, financial management skills, willingness of SMEs, and the knowledge level on the Islamic finance principles and products. These variables are theorised to influence trust, which in turn serves as a proxy indicator for the presence or absence of potential moral hazard challenge.

**Table 7.12 Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
3	0.59	0.34	0.33	31.90	4.00	245.00	<.001*

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The table 7.12 above presents the model fit statistics for Model 3, which is designed to predict trust. Trust is used in this study as a proxy for moral hazard in the context of Islamic participatory financing arrangements. The model exclusively includes psychometric variables as predictors including entrepreneurial skills, financial management skills, willingness of SMEs to adopt Islamic participatory financing, and knowledge level on Islamic finance principles and products. The coefficient of correlation of 0.59, indicates a moderate positive relationship between the independent variables and the dependent variable (trust). Furthermore, the coefficient of determination (R<sup>2</sup>) and the adjusted R<sup>2</sup> values are 0.35 and 0.33, respectively. These results suggest that approximately 33 per cent of the variance in trust and by extension, the entrepreneur's potential to mitigate moral hazard risk can be explained collectively by the included psychometric predictors. Although this figure indicates a moderate level of explanatory power, it provides meaningful evidence that behavioural and attitudinal traits play a non-trivial role in shaping trust, which is central to the viability of profit-and-loss sharing mechanisms under Islamic finance.

**Table 7.13 Model Coefficients – Trust**

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	2.20	0.22	10.01	<.001*	
Entrepreneurship skills	0.22	0.04	5.33	<.001*	0.30
Financial Management skills	0.15	0.03	4.38	<.001*	0.25
Willingness of SMEs	0.16	0.04	4.24	<.001*	0.24
Knowledge level	0.19	0.06	3.27	<.001*	0.18

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The table above presents the standardised coefficient estimates for each of the independent psychometric variables in Model 3, with trust serving as the dependent variable and a proxy for moral hazard in Islamic participatory financing. The standardised estimate for entrepreneurial skills is 0.30, indicating that a one-unit increase in the entrepreneurial skills of

SME clients is associated with a 0.30 (or 30 per cent) increase in trust. This suggests that stronger entrepreneurial capabilities enhance the perceived trustworthiness of SMEs, potentially reducing the risk of moral hazard. Similarly, the financial management skills variable has a standardised coefficient of 0.25, implying that a one-unit improvement in financial literacy or management competence leads to a 25 per cent increase in trust. The willingness of SME operators to adopt Islamic participatory financing also contributes positively, with a coefficient of 0.24, meaning that greater willingness correlates with a 24 per cent increase in trust. This suggests that SMEs who are more inclined to engage with the Islamic participatory modes of financing, may also be perceived as more trustworthy or committed.

Furthermore, the knowledge level of the SME operators regarding the Islamic finance principles and products, contributes a 0.18 increase in trust for every unit increase in knowledge. Although this is the smallest among the four predictors, it still reflects a meaningful and statistically significant relationship. Overall, the model demonstrates that all four independent variables entrepreneurial skills, financial management skills, willingness, and knowledge have statistically significant positive effects on trust at the 5 per cent significance level. This supports the hypothesis that psychometric attributes can meaningfully explain variations in trust and thus serve as useful indicators for assessing potential moral hazard risks in Islamic participatory financing arrangements.

#### **Model 4**

The below empirical model still uses operator trustworthiness as the dependent variable, with additional predictors in the model.

$$Y4 = \beta_0 + \beta_{14}x_{14} - \beta_{17}x_{17} + \beta_1x_1 + \beta_2x_2 + \beta_5x_5 + \beta_8x_8 + \beta_9x_9 + \beta_{11}x_{11} + \beta_{12}x_{12} + u$$

In this extended model, additional variables related to the firm and the entrepreneur attributes have been incorporated into the structure of Model 3 to evaluate their impact on SME operator trustworthiness, which remains the proxy for assessing moral hazard risk in Islamic participatory financing. These additional variables include firm age, years of business experience, educational level, respondent's age, operating leverage ratio, financial leverage ratio, and gender. The objective of this extension is to assess whether the inclusion of these structural and demographic factors, in combination with the previously examined psychometric variables, enhances the explanatory power of the model. It also aims to identify whether certain observable firm or individual characteristics have a significant influence on trustworthiness,

thereby offering practical insights for risk assessment and financing decisions by Islamic Financial Institutions.

**Table 7.14 Model Coefficients - Trust**

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept <sup>a</sup>	2.19	0.27	7.97	0.01*	
Entrepreneurial skills	0.22	0.04	5.00	<.001*	0.29
Financial management skills	0.14	0.04	3.67	<.001*	0.22
Willingness of SMEs	0.17	0.04	4.07	<.001*	0.25
Knowledge on Islamic Finance Principles and Products	0.18	0.06	2.75	<.001*	0.16
Firm Age	0.01	0.01	1.96	<.05*	0.16
Years of business experience	-0.02	0.02	-1.80	0.42	-0.06
Education level	0.00	0.02	-0.17	0.87	-0.01
Respondent's age	0.02	0.04	0.46	0.65	0.03
Operating leverage ratio	0.02	0.02	1.36	0.18	0.12
Financial leverage ratio	-0.02	0.02	-1.37	0.17	-0.12
Gender:					
1 – 0	-0.02	0.06	-0.25	0.80	-0.03

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The table 7.14 above presents the updated standardised estimates after the inclusion of additional the firm-level and entrepreneur-specific variables in Model 4. It is evident that, the inclusion of these variables has had a notable impact on the original psychometric variables. Specifically, the standardised estimate for the willingness of the SME operators to adopt the Islamic participatory modes increased from 0.24 to 0.25, indicating a slightly stronger influence on trust. Conversely, the remaining psychometric variables, including entrepreneurial skills, financial management skills, and knowledge level on the Islamic finance principles and products, all decreased from 0.30, 0.25 and 0.18 to 0.29, 0.22 and 0.16 because of the new variables needed to the model, suggesting that their influence become relatively less prominent when structural firm characteristics are considered. Among the newly variables introduced, the following standardised estimates were observed, firm age 0.16, indicating that as firms grow older, the level of trust increases, and hence lower perceived moral hazard. Respondent's age

and Operating leverage ratio both have a positive but insignificant relationship of 0.03 and 0.12 correlation coefficients with trust respectively. In contrast, years of business experience has a negative standardised estimates value of - 0.10, educational level -0.01, financial leverage ratio - 0.12, and gender -0.03. These predictors demonstrate a negative association with trust, implying that higher experience, educational attainment, financial leverage and the female gender, may paradoxically be linked to slightly reduced levels of perceived trustworthiness in this context.

Regarding statistical significance, only firm age among the seven added variables showed a statistically significant contribution to the model at the 5 percent level. The remaining six added variables years of experience, education, respondent’s age, financial leverage, operating leverage, and gender did not show statistically significant effects, suggesting that while they may influence trust to varying degrees, their effects are not strong enough to be generalised across the population studied. These findings highlight that, even after controlling for firm-level characteristics, psychometric traits particularly entrepreneurial skills, willingness, and Islamic finance knowledge remain key predictors of trust, reinforcing their value in managing moral hazard risk in Islamic participatory finance.

**Table 7.15 Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
3	0.60	0.35	0.34	24.80	4	227	<.001*
4	0.61	0.37	0.34	11.90	11	221	<.001*

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The table 7.15 above facilitates a direct comparison of the model fit statistics between Model 3 (psychometric variables only) and Model 4 (psychometric variables plus firm and entrepreneur-specific variables) enabling an assessment of the incremental contribution of the added predictors to the explained variance in trust used here as a proxy for moral hazard in Islamic participatory financing. As shown, the coefficient of correlation (R) increased slightly from 0.60 in Model 3 to 0.61 in Model 4, while the coefficient of determination (R<sup>2</sup>) rose from 0.35 to 0.37. The adjusted R<sup>2</sup>, however, remained constant at 0.34 across both models. This modest improvement in R and R<sup>2</sup> values suggests that the inclusion of structural firm and operator-level variables such as firm age, years of business experience, educational level,

respondent's age, financial leverage, operating leverage, and gender, offers additional explanatory power, albeit limited. The unchanged adjusted R<sup>2</sup> implies that while these added variables do contribute to the model, the overall improvement is not substantial when adjusted for the number of predictors. Nonetheless, the results provide evidence that firm-specific and demographic factors, alongside psychometric variables, jointly influence trust perceptions and may therefore play a role in assessing moral hazard risks in Islamic participatory financing. This underscores the value of an integrated evaluation framework that considers both qualitative (psychometric) and quantitative (structural) dimensions in the financing decisions made by Islamic Financial Institutions.

### **7.4.3 Step 3: IFI's Decision to use the Islamic Participatory Modes**

The core objective of the three-step evaluation framework developed in this study is to assist the Islamic Financial Institutions in making informed decisions regarding the deployment of Islamic participatory financing modes to their SME clients and prospective business partners. This decision as a target variable in this case, is primarily influenced by two critical variables including the financial viability of the SME, as evaluated in Models 1 and 2, using both quantitative firm-level metrics and psychometric predictors of firm performance and the SME operator trustworthiness as indicator for potential moral hazard, assessed through Models 3 and 4, based on both psychometric and structural variables. The decision-making capability of IFIs is therefore operationalised as their ability to accurately infer outcomes related to the two dependent variables that is firm performance and operator trustworthiness (moral hazard) into the core dependent variable of the study that is IFI's decision. This is tested in the final two models Model 5 and Model 6. In Model 5, the factors of the variables are used and in Model 6 the mean scores are used. Together, each of these serve as a composite decision-support tool, combining both the firm performance and trustworthiness variables to simulate the practical evaluation mechanism that could be used by IFIs in determining the suitability of an SME entrepreneur for extending Islamic participatory modes financing.

#### **Model 5**

The dependent variable and the predictor variables of the empirical model are discussed below.

$$Y_5 = \beta_0 + \beta_{14}x_{14} + \beta_{15}x_{15} + \beta_{16}x_{16} + \beta_{17}x_{17} + \beta_{18}x_{18} + \beta_{19}x_{19} + u$$

In Model 5, the primary dependent variable which is the decision of the Islamic Financial Institutions to deploy the Islamic participatory financing modes for SMEs is operationalised through a composite index derived from the factor scores of the two central outcome variables

that is operator trust (as a proxy for moral hazard) and firm performance. This composite index is constructed using the Thurstone method of estimation, which is a common technique for aggregating factor scores into a single latent index. The resulting index serves as a proxy for the overall likelihood that an IFI would approve participatory financing for a given SME client. The predictor variables in this model include the factor scores of the study's main psychometric constructs which are entrepreneurial skills, financial management skills and willingness of SMEs, knowledge level on the Islamic finance principles and products. In addition, the model incorporates both financial ratios (operating leverage ratio, financial leverage ratio, and solvency ratio) and non-financial ratios (firm age, ownership status, respondent's age, years of business experience, education level and gender). By using factor scores instead of raw or mean values, the model ensures a more statistically robust estimation by relying on latent constructs that account for measurement errors and inter-item correlations. This approach is particularly appropriate in psychometric and structural equation modelling contexts, where the objective is to capture underlying theoretical constructs rather than surface-level observations.

**Table 7.16 Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
5	0.78	0.60	0.59	57.1	6	227	<.001*

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The R squared and the adjusted R squared show the coefficient of determination which indicates the total impact of the independent variables collectively on the dependent variable. In this case, 0.60 or 60 per cent of the variance in the decision of Islamic finance institutions to use the Islamic participatory modes of financing for SMEs, is accounted for by, the entrepreneurial and financial skills of the SME operator, the willingness of the operator to use these modes of financing, the financial ratios as well as the non-financial ratios variables. These variables together have the power to explain over 60 per cent of the variance in the decision of IFIs to use the Islamic participatory modes of financing for SMEs.

**Table 7.17 Model Coefficients - Decision of IFIs to use Participatory Modes with Factor Scores**

<b>Predictor</b>	<b>Estimate</b>	<b>SE</b>	<b>t</b>	<b>p</b>	<b>Stand. Estimate</b>
Intercept	0.00	0.02	-0.17	0.86	
Entrepreneurial skills	0.09	0.02	4.34	<.001*	0.20
Financial management skills	0.11	0.02	5.53	<.001*	0.24
Willingness of SMEs	0.06	0.02	2.98	<.00*	0.14
Knowledge level on IF Principles and Products	-0.04	0.02	-2.02	<.05*	-0.09
Financial ratios	0.21	0.02	11.92	<.001*	0.53
Non-financial ratios	0.07	0.02	3.59	<.01*	0.16

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The table 7.17 above displays the standardised estimates, which represent the strength and direction of the relationship between each independent variable and the dependent variable, namely the decision of the Islamic Financial Institutions to deploy Islamic participatory modes of financing for SMEs. Starting with entrepreneurial skills, the standardised coefficient of 0.20 indicates that a one-unit increase in entrepreneurial skills corresponds to a 20 per cent increase in the likelihood that IFIs will finance SMEs through participatory modes. This suggests that entrepreneurial skills play a meaningful role in influencing IFIs' financing decisions, likely because skilled entrepreneurs are perceived as more capable of successfully managing their ventures and fulfilling partnership obligations.

Similarly, the financial management skills of SME entrepreneurs have a stronger positive effect, with a standardised estimate of 0.24. This means that a one-unit increase in financial management competency leads to a 24 per cent increase in the probability that IFIs will engage in participatory financing. This implies that enhanced financial management abilities, such as budgeting, cash flow management, and financial planning, significantly boost IFIs' willingness to provide participatory financing. It highlights the importance placed on the entrepreneur's capacity to manage funds responsibly and sustainably, which is critical in profit-sharing arrangements. The willingness of SMEs to engage in Islamic participatory financing also

positively impacts IFI's decisions, with a coefficient of 0.14. Entrepreneurs who are more open and eager to participate in such financing modes tend to encourage greater confidence from IFIs, possibly reflecting alignment in values and readiness to comply with Shariah-compliant contractual obligations.

The financial ratios variable which encompasses key measures like solvency, operating leverage, and financial leverage, carry the highest standardised estimate of 0.53. This substantial effect underscores that solid financial health and prudent financial management within the SME greatly increase IFI's propensity to offer participatory financing, given the reduced risk of loss and greater expected returns. Meanwhile, non-financial ratios variable including, firm age, respondent's age, ownership status, gender, years of experience, and education level, collectively exert a positive influence of 0.16 on IFI's decisions. Although smaller in magnitude compared to financial variables, but it however shows that these demographic and firm-specific characteristics provide additional explanatory power and influence IFI's evaluation beyond purely financial criteria.

Interestingly, the knowledge level of SME operators on Islamic finance principles and products demonstrates a negative relationship with the decision of IFI's to use participatory modes, with a standardised estimate of -0.09. This indicates that as entrepreneurs become more knowledgeable about Islamic finance, the likelihood of IFIs choosing to finance them through participatory modes decreases slightly. This counterintuitive result might be due to other factors, such as overconfidence or greater awareness of risks by knowledgeable entrepreneurs, or possibly IFI's concerns about the sophistication of applicants.

Overall, the model confirms that most of the predictor variables entrepreneurial skills, financial management skills, willingness to use Islamic financing, financial ratios, and non-financial ratios have a statistically significant and positive influence on IFIs' decisions to use Islamic participatory financing for SMEs. The exception is the knowledge variable, which is both negatively and statistically significant correlated with the IFI's decision for participatory modes of financing for SMEs. These findings highlight the multifaceted nature of IFIs' financing decisions, incorporating both quantitative financial indicators and qualitative entrepreneur characteristics.

### **Model 6**

$$Y_6 = \beta_0 + \beta_{14}x_{14} + \beta_{15}x_{15} + \beta_{16}x_{16} + \beta_{17}x_{17} + \beta_{18}x_{18} + \beta_{19}x_{19} + u$$

From the above empirical mode, in contrast to Model 5, where the dependent variable namely, the decision of Islamic Financial Institutions to use Islamic participatory modes of financing for SMEs was constructed using the factor scores derived from the variables (firm performance and operator trustworthiness), this model employs the mean scores of these variables to predict the dependent variable. Similarly, the predictor variables in this model are also represented by their mean scores rather than factor scores, as was done in Model 5. Using mean scores involves averaging the observed values of the variables, providing a more straightforward and intuitive representation of the data. This approach allows for a more direct interpretation of the variable's average impact on the decision-making process of IFIs.

While factor scores are composite indices derived from underlying latent variables, mean scores reflect the raw average responses or values, which can sometimes offer clearer insights for practical application. Therefore, this model offers an alternative measurement strategy to Model 5, aiming to validate the robustness of the findings by comparing the influence of predictors on the IFI's decision when using mean scores instead of factor scores. The predictor variables included remain consistent, covering entrepreneurial skills, financial management skills, willingness of SMEs, knowledge level of Islamic finance principles and products, relevant financial ratios variable comprising the three ratios highlighted earlier, and the non-financial ratios comprising firm and operator-specific characteristics.

**Table 7.18 Model Fit Measures**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Overall Model Test			
				F	df1	df2	p
6	0.88	0.77	0.76	123	6	227	<.001*

Note. Models estimated using sample size of N=234

From the 7.18 table above, the strength of the relationship between the dependent variable and the independent variables is represented by the correlation coefficient (R) of 0.88, indicating a strong positive association. This means that as the independent variables increase or improve, the likelihood of IFIs deciding to use the Islamic participatory modes of financing for SMEs also increases significantly. Furthermore, the collective explanatory power of the independent variables on the dependent variable is captured by the R squared value of 0.77. This indicates that 77 per cent of the variation in the IFI's decision to use participatory financing modes is explained by the combined effect of the predictor variables included in the model. Conversely,

the remaining 23 per cent of the variance is attributable to factors not included in the model, which could be other external or unmeasured influences. The high R squared value underscores the strong suitability and effectiveness of the selected independent variables in explaining the decision-making process of IFIs regarding Islamic participatory financing, suggesting the model is well-specified and reliable for this analysis.

**Table 7.19 Model Coefficients - Decision of IFIs to use Participatory Modes with Mean Scores**

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	1.61	0.38	4.28	<.001*	
Entrepreneurial Skills	0.16	0.07	2.35	<.02*	0.08
Financial Management Skill	0.24	0.06	4.17	<.001*	0.15
Willingness of SMEs	0.03	0.06	0.36	0.72	0.01
Knowledge level on IF Principles and Products	-0.56	0.10	-5.62	<.001*	-0.19
Non-financial predictors	0.11	0.03	4.26	<.001*	0.15
Financial Ratios	0.43	0.02	21.16	<.001*	0.73

*Note.* \* p < .05, \*\* p < .01, \*\*\* p < .001

The impact of using a different scoring technique is evident in the changes observed in the standardised estimates of the variables. For example, the standardised estimate for the entrepreneurial skills variable dropped significantly from 0.20 in the previous model to 0.08. Similar declines were observed for other variables including financial management skills decreased from 0.24 to 0.15, and the willingness of SMEs sharply declined from 0.14 to 0.01. The knowledge level on Islamic finance principles and products variable not only decreased but also shifted further into negative territory, moving from - 0.09 to - 0.19. By the same token the non-financial ratios also decreased from 0.16 to 0.15. Conversely, and financial ratios variables experienced increases in their standardised estimates, rising from 0.53 to 0.73. Notably, the financial ratios variable exerts the greatest influence on the dependent variable, highlighting the predominance of financial indicators over qualitative factors in influencing the decision of Islamic Financial Institutions to adopt Islamic participatory modes of financing. Statistical significance tests reinforce these observations, all independent variables except for the knowledge level on Islamic finance principles and products, which has a significant

negative relationship, and the willingness of SMEs, which shows a non-significant positive relationship, demonstrate strong, positive, and statistically significant effects on the decision of IFIs to use Islamic participatory financing modes for SMEs. Overall, the results highlight the complex dynamics between quantitative financial factors and qualitative psychometric variables in shaping institutional financing decisions, emphasising the need for IFIs to carefully balance these dimensions when evaluating prospective SME clients.

## **7.5 Conclusion**

In this chapter, the empirical examination on the research data was done through psychometric testing with multiple regressions. The chapter has systematically developed and validated a screening framework that Islamic Financial Institutions can use to evaluate the suitability of employing the Islamic participatory modes of financing for SMEs. Through a multi-step empirical process involving regression modelling with psychometric, the chapter demonstrates how both financial and non-financial (psychometric) variables can be effectively combined to assess, the financial viability of SME ventures and the potential moral hazard risks inherent in profit-and-loss sharing arrangements, as well as use these findings as the basis to inform the IFI's decision to finance using participatory modes or not.

The first step established the financial performance of SMEs, showing that solvency and operating leverage ratios were the strongest and most consistent predictors of firm performance. When psychometric variables were added to the model, financial management skills emerged as a statistically significant determinant, reinforcing the relevance of qualitative traits in performance analysis. The second step addressed SME operator trustworthiness for the potential moral hazard challenge, with trust used as a proxy for gauging the risk of opportunistic behaviour in the Islamic participatory financing modes. It was shown that psychometric variables particularly entrepreneurial skills, financial management skills, willingness to use the Islamic participatory modes and knowledge level on Islamic finance principles and products, all significantly influenced trust. Among the added demographic and firm-level predictors, only firm age had a significant impact on trust, further validating the prominence of behavioural indicators over static demographic variables in assessing moral hazard risks.

The final step examined the combined effect of these indicators on the actual decision of IFIs. Both models (based on factor scores and mean scores) confirmed that financial ratios are the most dominant predictors of the IFI's decision to use participatory modes. However, psychometric indicators especially financial management skills and entrepreneurial competencies also made substantial and statistically significant contributions, confirming that

a blended evaluation approach yields a more robust decision framework. In sum, the result of this investigation underscores the value of an integrated screening mechanism that combines traditional financial metrics with psychometric profiling to assess both the performance potential and ethical suitability of SMEs seeking Islamic participatory finance. Such a comprehensive approach can significantly improve the confidence of IFIs in extending participatory financing to SMEs, reduce moral hazard, and ultimately promote the broader use of equity-based Islamic financial instruments in the SME sector.

## CHAPTER 8

# SCREENING SME CLIENTS FOR THE USE OF THE ISLAMIC PARTICIPATORY MODES OF FINANCING: A DATA MINING APPROACH WITH DECISION TREE

### 8.0 Introduction

Decision-making is a fundamental human activity, particularly within the context of economic and business operations. Kuruppuge and Gregar (2020 p.5) define a business decision as ‘a judgement to achieve organisational objectives efficiently and effectively’. In today’s competitive business environment, optimal decision-making is essential for ensuring the sustainability and growth of business enterprises (Márquez et al, 2019). While the demand for quick and optimal decisions has become increasingly pressing, such decisions often require significant resource investments, particularly in the form of advanced technologies and analytical tools (Danilova et al, 2019). The dynamic and unpredictable nature of modern business landscapes have made effective decision-making critical for institutional survival and competitiveness. As noted by Koziół-Nadolna and Wiśniewska (2020) the decisions made by organisational leaders can ultimately determine the success or failure of their enterprises. Consequently, decision-making processes should not be driven by intuition or personal preferences, but rather grounded in evidence, structured methodologies, and sound knowledge. A scientific approach to decision-making not only provides a systematic framework but also equips the decision maker with appropriate tools for reaching optimal outcomes (Danilova et al, 2019). The ongoing digital transformation has significantly reshaped how businesses operate and make decisions. This shift is particularly evident in the integration of emerging technologies such as data mining, analytics, and artificial intelligence (AI) into strategic management functions such as decision-making. Many organisations, especially within the financial sector, possess vast amounts of underutilised client data. However, with the advent of advanced computing power and AI-driven technologies, institutions are now increasingly able to extract actionable insights from these data repositories through data mining techniques. This evolution has empowered firms to make more informed, timely, and strategic decisions.

Corporate decision-making is fundamentally shaped by the institutional logic that underpins organisational structures and practices. As noted by Teixeira et al (2017) institutional logic is

increasingly recognised as being embedded in organisational routines, thereby guiding daily operations, including strategic decision-making processes. Within the context of Islamic Financial Institutions, the decision to provide financing to Small and Medium Enterprises through the Islamic participatory modes, constitutes a particularly critical and complex undertaking. This is largely due to the elevated risks inherent in SME financing generally, compounded by the unique risk-sharing nature of Islamic participatory contracts. Accordingly, the decision to adopt such financing mechanisms must be informed by a systematic and comprehensive evaluation of SME clients, particularly through the identification and classification of viable candidates. This classification must be based on available quantitative and qualitative data to ensure objective, data-driven decision-making.

A range of classification models have been employed in this regard, including statistically grounded approaches such as logistic regression, which remains a commonly used tool in financial and credit decision modelling (Safarkhani and Moro, 2021). However, decision tree algorithms have emerged as particularly influential in the field of data mining, offering a robust alternative for classification tasks (Gunduz and Lutfi, 2021). According to Cizel (2018) one of the key advantages of decision trees lies in their capacity to generate interpretable classification rules that often outperform traditional logistic regression models in predictive accuracy (see also Moro, et al., 2014). Moreover, decision tree models are inherently flexible, capable of capturing both linear and non-linear relationships between variables relationships (Yeo and Grant, 2018). These characteristics make them particularly well-suited for modelling the multifaceted and interdependent factors that influence the IFI's decisions regarding the deployment of Islamic participatory financing instruments for SMEs.

The extant literature demonstrates that decision tree techniques as one of the most widely used machine learning methods, have been successfully applied across various sectors, including retail, banking, education, and healthcare, where large volumes of data are generated (Mienye et al, 2019). Within the domain of SME financing, there is a growing body of scholarly work calling for innovative and data-driven approaches to overcome the persistent financing constraints faced by SMEs. This study responds directly to this call by exploring how data mining techniques, particularly decision tree classification, can inform the financing decisions in the context of Islamic participatory finance. In this section, the focus is on classifying SME entrepreneurs into two categories either 'suitable' or 'unsuitable', for the deployment of the Islamic participatory modes of financing. The Islamic participatory modes are equity-based or equity-like financing mechanisms and require a partnership-like engagement between the

Islamic Financial Institutions and SME clients, often described as ‘skin-in-the-game’ arrangements.

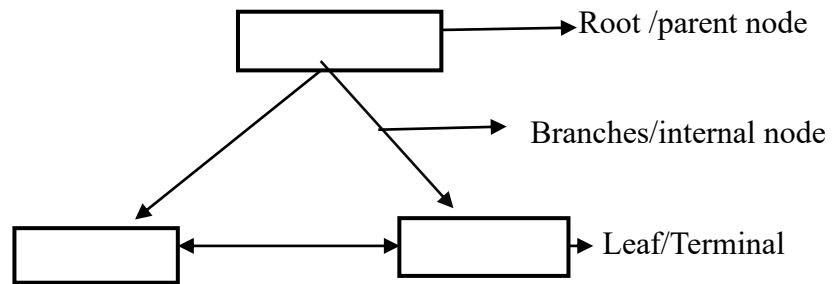
Thus, the primary aim in this chapter is to develop a classification model that discriminates effectively between SME entrepreneurs, thereby supporting IFIs in making informed and Shariah-compliant financing decisions. Such an approach has the potential not only to expand access to funding for SMEs but also to help bridge the significant SME financing gap by promoting risk-sharing instruments with better aligns with Islamic economic principles.

## **8.1 A Decision Tree**

A decision tree is commonly defined as a flowchart-like tree structure that develops a set of decision rules used for prediction or classification (Islam and Habib, 2015). Similarly, a decision tree has also been defined as a set of decision rules, presented visually in the form of a tree (Yeo and Grant, 2018). Decision trees fall under the category of supervised learning algorithms and are widely employed to construct predictive models. These models are trained on historical data to learn decision rules that can accurately classify or predict the value of a new target variable (Jijo and Andulazeez, 2021). Hence, decision trees represent a robust statistical technique used extensively in data mining for both prediction and classification tasks. As a decision support tool, the primary goal of decision tree classification algorithms is to learn a model during the training phase and apply the knowledge in predicting the class of the target variable using a classification technique (Gupta et al, 2017).

The decision tree structure primarily takes the form of an inverted natural tree, it comprises root nodes, internal or branch nodes, as well as leaf or terminal nodes. In the decision tree structure, the topmost root is the attribute amongst all the attributes of the data that is the best to split the data based on the technique utilised. The branches or the internal nodes are the values of the attribute selected for the splitting of the nodes. Finally, the leaf or terminal nodes represent the value of the outcome attribute. Thus, in a decision tree, each node represents an attribute, each branch represents the values of the tested attribute, and each leaf represents the classification categories (Lin and Fan, 2019). The basic structure of a decision tree below, has been constructed based on the works of (Harsh and Prajapati, 2018; Jijo and Andulazeez, 2021) and others.

**Figure 4 Basic Structure of a Decision Tree**



Classification is a technique of data analysis in which the algorithms assign one of the predefined classes to a new observation based on the observed values of the attribute variables (Alrasheedi, 2023). Categorisation may be another name for classification. It is a process by which items or objects are differentiated, recognised, and understood. In data mining, algorithms that carry out this task are called classifiers. Classification is a commonly used technique in data mining, and a decision tree is one of several classification algorithms available.

## **8.2 Decision Tree Algorithms**

Over the years, scholars and researchers have developed a range of algorithms within the field of data mining to address the problem of classification. These classification algorithms employ diverse criteria, methodologies, and data types to categorise observations into predefined classes. Each algorithm is designed with specific strengths and limitations, making them suitable for different types of data structures and problem contexts. Below, we briefly discussed a selection of the classification algorithms used in this research to provide a foundational understanding of their roles and applications in a data-driven decision-making.

### **8.2.1 Classification and Regression Tree (CART)**

The Classification and Regression Tree (CART) algorithm was introduced by Breiman et al (1984) and is widely recognised for its versatility in handling both classification and regression tasks. Unlike many other algorithms that are restricted to a single type of predictive modelling, CART can construct either a classification tree when the target variable is categorical or a regression tree, when the target variable is continuous. A key feature of the CART algorithm is its use of the Gini index as a measure of node impurity. The algorithm selects the attribute that results in the greatest reduction in impurity to split the dataset at each node. This splitting criterion enables CART to build an optimal tree structure for prediction. Additionally, the

algorithm can handle datasets with both categorical and numerical variables and offers robust mechanisms for dealing with missing data, making it a practical and powerful tool in data mining and predictive modelling.

### **8.2.2 Chi-square Automatic Interaction Detector (CHAID).**

The Chi-squared Automatic Interaction Detection (CHAID) algorithm, developed by Kass (1980) is an extension of the earlier Automatic Interaction Detector (AID). As a decision tree classification method, CHAID is particularly known for identifying and exploiting interactions between variables to construct its tree structure. The algorithm employs adjusted significance testing, typically based on the chi-squared test, to determine the most appropriate attributes for splitting nodes. It iteratively merges categories of predictor variables that are not significantly different with respect to the target variable, ensuring that each child node comprises homogenous groups of observations. A notable strength of CHAID is its ability to handle both continuous and categorical data, as well as manage missing values effectively. These features make it a flexible and robust tool, particularly useful in exploratory data analysis and in situations where the relationships between variables are complex and multi-level.

### **8.2.3 C5.0**

The C5.0 algorithm represents an advanced iteration in the family of decision tree algorithms originally developed by Quinlan (1986) following his earlier versions ID3 (Iterative Dichotomiser3) and C4.5. As an enhancement of both ID3 and C4.5, the C5.0 algorithm offers substantial improvements in speed, memory efficiency, and overall performance. It employs information gain as its splitting criterion, selecting the attribute that maximises the reduction in entropy at each node. The recursive partitioning process continues until no further meaningful splits can be made, ultimately forming terminal (leaf) nodes. In addition to its computational efficiency, C5.0 can handle missing values and attributes with multiple categorical values, making it a robust and scalable tool for classification tasks in diverse and complex datasets.

### **8.2.4 REPTree**

The Reduced Error Pruning Tree (REPTree) is a fast and efficient decision tree learning algorithm commonly implemented in the WEKA data mining software suite. It builds multiple regression trees through iterative processes and selects the most optimal tree as the final model. REPTree utilises information gain as the splitting criterion during the tree construction phase

and applies mean squared error (MSE) as the pruning criterion to avoid overfitting. The algorithm is specifically designed to handle numeric attributes, and it addresses missing values using the fractional instance approach from the C4.5 algorithm. Owing to its speed and pruning strategy, REPTree is particularly suitable for large datasets where predictive accuracy and computational efficiency are both priorities.

**Table 8.0 Comparison of Decision Tree Classifiers Algorithms**

<b>Methods</b>	<b>CART</b>	<b>CHAID</b>	<b>C5.0</b>	<b>REPTree</b>
<b>Class/Dependent variable</b>	Categorical and Continuous	Categorical	Categorical and Continuous	Continuous
<b>Input variable</b>	Categorical and Continuous	Categorical and Continuous	Categorical and Continuous	Continuous
<b>Procedure</b>	Top-down tree Construction	Multiple splits	Top-down tree Construction	Multiple splits
<b>Splitting Criterion</b>	Gin impurity	Chi-square	Entropy info gain	Information Gain

### 8.3 The Variables

#### Trust

This attribute is designed to assess the trustworthiness of the prospective SME applicant. Given the nature of Islamic participatory modes of financing which are a non-fixed return arrangement, the need for trust becomes paramount, as the returns to the Islamic financial institution are not only directly tied to the actual performance of the financed enterprise, but as well to the truthful declaration as such by the entrepreneur. Following factor analysis, this attribute was effectively measured using five out of the original ten questionnaire items. The trust variable thus serves as a critical input for IFIs in evaluating whether an entrepreneur is likely to report performance outcomes accurately and uphold contractual obligations. In this study, the variable is classified into two categories including ‘trustworthy’ and ‘untrustworthy’.

#### Financial Management Skills

This attribute captures the level of financial literacy and management competence of the SME entrepreneur. It was measured using five questionnaire items selected based on factor analysis.

The purpose of this attribute is to provide Islamic financial institutions with insight into whether a prospective SME client possesses the necessary financial management skills to make sound financial decisions that align with the interests of the IFI. This is particularly important in participatory financing arrangements, where mismanagement can directly affect investment outcomes. The variable is categorised into two levels including ‘good’, or ‘poor’.

### **Entrepreneurial Skills**

This attribute assesses whether the prospective SME candidate possesses the requisite business knowledge and entrepreneurial experience necessary to effectively and profitably manage the proposed project. It serves as a key indicator for the Islamic financial institutions in evaluating the entrepreneurial capability of the entrepreneur. The attribute was measured using 11 questionnaire items selected through factor analysis. The responses were categorised into two levels of competence including ‘good’, or ‘poor’.

### **Willingness of SME Entrepreneurs**

This attribute captures the willingness of SME entrepreneurs to engage in risk- and reward-sharing arrangements, which is a fundamental characteristic of Islamic participatory modes of financing. These financing models are inherently mutualistic and ‘skin-in-the-game’ in nature, requiring both parties that is the financier and entrepreneur to jointly bear the outcomes of the investment. The attribute is intended to inform the Islamic Financial Institutions about the entrepreneur’s openness to this principle of equitable participation. It was measured using six questionnaire items, and responses were categorised as either ‘willing’ or ‘unwilling’.

### **Knowledge of SME Entrepreneurs on Islamic Finance Principles and Products**

Unlike the dominant conventional debt-based financing models, the Islamic participatory modes of financing are founded on distinct Shariah-compliant contracts, each with unique characteristics and legal underpinnings. This variable seeks to measure the SME entrepreneur’s level of knowledge and understanding on both the general principles of Islamic finance and the specific features of participatory contracts such as *Musharakah* and *Mudarabah*. The attribute was assessed using nine items in the questionnaire. Based on the responses, the knowledge level was categorised as ‘good’, or ‘poor’.

## **Firm Performance**

Islamic participatory modes of financing are non-fixed return investment mechanisms, wherein the financier earns a return only if the financed project yields actual profits, and such profits are accurately reported. As a result, assessing the financial viability and profitability of the proposed project becomes critical. This attribute is designed to inform the financier about the potential economic performance of the enterprise under consideration. It was measured using five items in the questionnaire, with possible outcomes categorised as ‘good’, or ‘poor’.

## **Non-financial Ratios**

The adoption of Islamic participatory modes of financing necessitates a comprehensive assessment of both entrepreneur-specific and firm-level characteristics. This attribute captures the combined influence of several key factors namely gender, educational attainment of the entrepreneur, years of business experience, ownership structure, firm age, business sector, and number of employees on the likelihood of utilising Islamic participatory financing by IFIs in SME financing. The variable aims to determine whether these characteristics collectively contribute meaningfully to the IFI’s decision-making process. The possible classification outcomes for this attribute are ‘relevant’ or ‘irrelevant’.

## **Financial Ratios**

Given that the financier’s return in the Islamic participatory modes of financing is theoretically contingent upon the actual performance of the financed project, this variable is designed to assess the financial health and viability of prospective SME entrepreneurs. It does so by evaluating key financial ratios, namely solvency, operating leverage, and financial leverage. The variable is constructed as a composite index measured through these three items. Based on the assessment, the financial condition of the entrepreneur is classified as either ‘strong’ or ‘weak’.

## **Decision of Islamic finance institutions to use the Participatory Modes**

The dependent variable and the primary focus of this research is the decision outcome regarding the suitability of SME applicants for the Islamic participatory modes of financing. This variable serves as the target or class attribute in the decision tree classification model, and all preceding independent variables contribute toward its prediction. To measure this target variable, the study employed a composite index derived from both the mean scores and factor scores of two critical constructs that is, SME operator’s trust and SME firm performance.

Following the computation of these indices, participant's scores were ranked in order from highest to lowest. Specifically, the mean score ranged from 7.0 (highest) to 1.5 (lowest), while the factor score ranged from 0.7 to -1.8. For model training and evaluation, a binary classification was applied. SME applicants with mean scores ranging from 7.0 to 4.5 were categorised as 'Suitable' (i.e., good for Islamic participatory financing), and those with scores from 4.5 to 1.5 were classified as 'Unsuitable' (i.e., bad). Similarly, based on the factor scores, values from 0.7 to 0.0 were assigned as 'Suitable', and those from 0.0 to -1.8 were designated 'Unsuitable'. This stratification effectively divides the dataset into two balanced classes, thereby enhancing the learning capability and predictive accuracy of the classification model. The categorical outcomes for the dependent variable are represented as 'Suitable' or 'Unsuitable' based on the median scores of 4.55 for mean and 0.0 for factor, indicating the IFI's final decision on whether an SME candidate qualifies for Islamic participatory financing.

**Table 8.1 Research Attributes and their Possible Values**

No	Attribute	Possible Values
1	Trust	Trustworthy/Untrustworthy
2	Financial Management Skill	Good/Poor
3	Entrepreneurial Skills	Good/Poor
4	Willingness of SME entrepreneurs	Willing/Unwilling
5	Knowledge of SME entrepreneurs	Good/Poor
6	Firm performance	Good/Poor
7	Non-financial Ratios	Relevant/Irrelevant
8	Financial Ratios	Strong/Weak
9	Decision of IFIs	Suitable/Unsuitable

## 8.4 Scoring Technique

Credit scoring models are widely utilised by financial institutions, particularly banks, to assess the creditworthiness of loan applicants and distinguish between those likely to repay and those at higher risk of default. As such, credit scoring is inherently a classification problem, involving the systematic categorisation of applicants based on predictive indicators (Hand, 1981; Anderson, 2003). A review of the extant literature reveals that a variety of scoring techniques have been employed in both classification and prediction tasks, with statistical methods traditionally dominating this space. Within the banking sector, scoring remains a crucial instrument for evaluating clients and informing financing decisions (Abdou and Pointon, 2011).

In defining credit scoring as a core predictive methodology in banking, Anderson (2007) deconstructs the term into its two components including credit and score. The term credit according to him, is derived from the Latin *credo*, meaning ‘I believe’ or ‘I trust in’, and refers to the fundamental financial concept of ‘buy now and pay later’. The term score, in contrast, reflects the use of quantitative methods to assign numerical values that rank or classify applicants based on specific characteristics or risk factors. Thus, credit scoring can be broadly defined as the application of statistical techniques to convert relevant borrower data into a numerical assessment, facilitating more informed and objective credit decision-making (Abdou and Pointon, 2011; Anderson, 2007).

While traditional credit scoring is primarily designed to evaluate the creditworthiness of individuals receiving loans, thus, the evaluation for the Islamic participatory modes of financing which are not conventional debt-based instruments, necessitate a distinct or augmented evaluative approach. Unlike plain-vanilla loan arrangements, the Islamic participatory financing mechanisms involve equity-like structures, shared risk, and profit-and-loss sharing, which demand a broader assessment of both qualitative and quantitative factors. As argued by Paleologo et al (2010) the nature and requirements of scoring systems must align with the financial instruments being evaluated. Similarly, Altman and Haldeman EI (1995) advocate for the inclusion of primary client data and supplementary systems in designing robust credit evaluation models. Considering these recommendations, the present research adopts a psychometric approach to evaluate the entrepreneur and firm-level attributes as the basis for scoring prospective SME applicants. Specifically, two key scoring techniques that is, mean score and factor score are employed to generate composite indices representing SME entrepreneur’s trustworthiness and firm performance. These scores are then used as input variables for subsequent classification analysis, helping to assess the suitability of SME applicants for Islamic participatory financing schemes.

## **8.5 The WEKA Software**

The Waikato Environment for Knowledge Analysis (WEKA) is a comprehensive data mining software suite developed by a team of machine learning researchers at the University of Waikato, New Zealand (Ian et al., 2011). WEKA comprises a rich collection of machine learning algorithms designed for a wide range of data mining tasks, including classification, regression, clustering, and feature selection (Hamoud, 2016). One of the key strengths of the WEKA platform lies in its user-friendly workbench, which provides access to numerous state-of-the-art algorithms and tools for both data pre-processing and post-processing. WEKA’s

flexibility enables users to experiment with multiple algorithms on the same dataset, facilitating rigorous model comparison. It also supports data visualisation, allowing researchers to graphically interpret both input data and model outputs. As noted by Kalmegh (2015) the platform provides an integrated environment where users can prepare data, train, and assess models' performance statistically, and identify the most suitable algorithm for a given predictive task. These features make WEKA a valuable tool for researchers and practitioners alike in the field of data science and machine learning.

## **8.6 Decision Tree Analysis**

The process of decision tree analysis as a statistical technique can generally be divided into two primary phases i.e., model training and model validation. The model training phase involves constructing the decision tree using a designated portion of the dataset, commonly referred to as the training data. This phase aims to develop a predictive model that accurately captures patterns and relationships within the data relevant to the research problem. Conversely, the model validation phase assesses the performance and generalisability of the trained model by applying it to a separate portion of the data referred to as the testing or validation dataset, which was not used during the training process. This two-step procedure ensures that the decision tree model is not only tailored to the training data but also capable of making accurate predictions on new, unseen data.

### **8.6.1 Model Training and Validation**

Model building and training constitute a critical component of machine learning, wherein artificial intelligence (AI) systems are developed to produce predictive models with a high degree of accuracy (Mohammed and Alsunos, 2022). A defining feature of machine learning and AI is their reliance on data, rather than human-crafted logic, to perform tasks traditionally executed by humans. As such, the process of building and training models is essential for ensuring that these systems can learn effectively and deliver reliable outcomes. In the model-building phase, machines are provided with structured instructions in the form of learning algorithms, which guide them in identifying patterns and relationships within the dataset. As noted by Yadav and Shukla (2016 ) key considerations in model building include the size and quality of the dataset, the number of instances, and the risks of overfitting and underfitting, both of which can significantly affect the model's overall performance and generalisability.

Model validation is a crucial step following the training phase, as it evaluates the predictive performance and generalisability of the developed model. In statistical modelling, and

particularly in decision tree analysis, a variety of validation techniques are discussed in the literature. This study adopts two widely used validation techniques available in the WEKA software environment that is, cross-validation (CV), and hold-out validation, also known as data partitioning (Yadav and Shukla, 2016 ). Cross-validation, often referred to as k-fold validation, and occasionally as leave-one-out when k equals the number of observations, involves dividing the dataset into a K equal parts or folds. In each iteration, one-fold is reserved as the test set while the model is trained on the remaining k-1 folds. This process is repeated k times, ensuring that each fold serves as the test set exactly once. The overall model accuracy is then computed as the average of the accuracies across all  $k$  iterations, providing a robust estimate of the model's performance.

Hold-out validation, as the name implies, is a relatively straightforward technique for evaluating model performance. In this approach, the dataset is partitioned into two distinct subsets either in equal or unequal proportions. One subset is used for training the model, while the remaining portion is reserved for testing. A key challenge with this method lies in determining the optimal ratio for splitting the data (e.g., 80:20, 75:25, or 50:50). As such, researchers often experiment with various split ratios to identify the configuration that yields the highest predictive accuracy. In the present study, two primary testing methods were employed to assess the performance of the classification algorithms used. Initially, the entire dataset was utilised to train the model. Subsequently, k-fold cross-validation, as previously discussed was applied as the first mode of testing. This was followed by a percentage split, in line with the hold-out validation technique. To comprehensively evaluate the performance of the models, several standard metrics were adopted. These include overall and class-specific accuracy (derived from the confusion matrix), precision, recall, and the F-measure each of which is defined and discussed in the subsequent section.

**Accuracy:** It is one of the most used metrics for evaluating the performance of classification models. It is defined as the overall efficiency of the classifier in correctly predicting class labels (Jaafari et al, 2018). In essence, accuracy measures the proportion of total correct predictions (both true positives and true negatives) relative to the total number of instances evaluated. It indicates how often the classifier correctly assigns instances to their actual classes.

**Precision:** It is a performance evaluation metric that measures the proportion of correctly predicted positive instances out of all instances that were predicted as positive. It reflects the classifier's ability to avoid false positives by quantifying the accuracy of positive predictions.

According to Miao and Zhu (2022) precision is defined as the percentage of predictive positive class samples that are correctly classified. It is often regarded as a measure of exactness or purity in the classification process (Sharma and Devi, 2015).

**Recall:** Recall, also known as Sensitivity or the True Positive Rate, is a metric used to evaluate the performance of classification models, particularly in identifying relevant instances. While precision focuses on how many of the predicted positive instances are truly positive, recall measures how many of the actual positive instances have been correctly predicted by the model. It is often considered the flip side of precision Sharma and Devi (2015) as it evaluates the model's ability to capture all relevant cases within a dataset.

**F-Measure:** The F-Measure (also known as the F1-Score) is a comprehensive performance metric that integrates both Precision and Recall, which are often considered as complementary or trade-off metrics. While precision measures the exactness of positive predictions and recall evaluates the completeness, the F-measure offers a single score that balances both (Miao and Zhu, 2022). It is especially useful when seeking a balance between false positives and false negatives. As a measure of classification accuracy, the F-measure is defined as the harmonic mean of precision and recall (Jankovic, 2019).

## **Confusion Matrix**

The confusion matrix, sometimes referred to as the accuracy matrix or classification matrix, is one of the most widely used tools for evaluating classification models, particularly in finance and accounting research. It provides a detailed summary of prediction outcomes by comparing actual and predicted class labels for a given dataset. A confusion matrix presents a tabular format of the results of a classification algorithm, illustrating the number of true positives (TP), true negatives (TN), false positives (FP), and false negatives (FN). These four components enable researchers to calculate key performance indicators such as accuracy, precision, recall, and F-measure. By capturing the interaction between actual and predicted classifications, the confusion matrix helps assess not only the overall performance of a model but also its strengths and weaknesses in identifying each class. This makes it an essential diagnostic tool in model evaluation and comparison.

## **8.7 Decision Trees**

### **8.7.1 Decision Tree Based on Mean Scores**

The mean score is one of the traditionally popular test scoring techniques widely reported in the literature. It can be described as a central value that represents the average of a set of

observed values, effectively summarising them into a single representative metric (Schober, et al., 2018). In this study, the research variables were each measured using between five and eleven items. The average or mean score derived from these items was subsequently used as input for running the decision tree algorithms. Numerous evaluation metrics have been used in prior literature to assess and compare the performance of decision tree classifiers, with accuracy being the most frequently reported (Alrasheedi, 2023). Among these evaluation techniques, K-fold cross-validation has become the gold standard for validating models such as decision trees and logistic regression (Vrigazova, 2021). This is largely due to its robustness, reduced likelihood of overfitting or underfitting, and its ability to produce more generalisable results, despite its relatively high computational cost.

In this study, K-fold cross-validation and the confusion matrix have been adopted as the primary evaluation metrics for assessing classifier performance. Additional performance indicators such as processing time, number of attributes in the final tree, and precision-based measures are also considered in determining the overall efficiency and applicability of each model. The table below presents the results of various classifier algorithms based on the participant's mean scores on the research variables. For each performance metric, the results of model training as well as the two test methods employed are reported. In the WEKA environment, two primary evaluation methods for classifier algorithms are utilised i.e., cross-validation and the dedicated test set approach (Bouckaert et al, 2015). According to (Waikato University, 2013) the most reliable evaluation results are typically achieved when the test dataset is independent of the training data, thereby minimising bias in performance estimates.

**Table 8.2 Classification base on Mean scores**

Algorithms	Accuracy			Precision			Recall			F-Measure		
	Train	CV	80%	Train	CV	80%	Train	CV	80%	Train	CV	80%
<b>CART</b>	0.8	0.75	0.78	0.8	0.76	0.79	0.8	0.76	0.78	0.8	0.75	0.78
<b>CHAID</b>	0.83	0.78	0.75	0.84	0.78	0.75	0.83	0.78	0.75	0.83	0.78	0.75
<b>C5.0</b>	0.82	0.76	0.78	0.83	0.77	0.80	0.82	0.77	0.78	0.82	0.76	0.78
<b>REPTree</b>	0.75	0.76	0.7	0.81	0.76	0.71	0.76	0.76	0.7	0.74	0.76	0.7

Based on the results illustrated in the diagram above, the cross-validation test employed as one of the principal performance evaluation techniques, reveals that the CHAID algorithms achieved a classification accuracy rate of 78 per cent. Thus, the CHAID algorithm emerges as the best-performing classifier, followed by C.50 and REPTree both having a classification

accuracy rate of 0.76 per cent. The CART came out as the least effective classifier based on the research data. Regarding the cross-validation metrics of precision, recall, and F-measure, the algorithms maintained a similar performance pattern with the CHAID producing 78 per cent across the three metrics i.e., precision, recall and F-measure. This followed by the C5.0 algorithm, then REPTree and finally CART algorithm. In summary, using the cross-validation CV performance metrics, the CHAID algorithm has demonstrated the most robust and consistent performance. Consequently, the classification results and the decision tree derived from the CHAID algorithm based on the participant’s mean scores are presented in the subsequent section.

**Table 8.3 Results of CHAID Classifier Algorithm**

Number of leaves	7					
Size of the tree	12					
Time taken to build the Model	0.02	%				
Correctly classified instances	238	78.2895				
Incorrectly classified instances	65	21.3816				
<b>Detailed Accuracy by Class</b>						
	TP Rate	FP Rate	Precision	Recall	F-measure	Class
	0.73	0.16	0.82	0.73	0.77	<b>Suitable</b>
	0.84	0.27	0.76	0.84	0.79	<b>Unsuitable</b>
<b>Weighted Average</b>	0.79	0.22	0.79	0.79	0.79	

The table 8.3 above presents key outputs of the CHAID algorithm as applied to the research data. While the output dialog box includes a variety of technical details, the analysis here focuses on the core metrics relevant to classification tasks namely, the classification of instance statistics, detailed accuracy by class, and the confusion matrix as these are the standard evaluation outputs typically reported in classification studies. The results indicate that 238 out of 304 instances were correctly classified into their actual classes, yielding a classification accuracy rate of approximately 78.5 per cent. In contrast, 65 instances were incorrectly classified, accounting for about 21.5 per cent of the dataset.

Within the detailed accuracy by class section, the true positive rate (TP rate) and false positive rate (FP rate) illustrate the relationship between predicted classifications and their actual class labels. As a general principle, a true positive rate indicates the proportion of instances where the predicted class matches the actual class, whereas a false positive rate reflects instances where the model predicts a positive class (e.g., suitable), but the actual class is negative (e.g.,

unsuitable), or vice versa (Bytenskaya, nd). In this study, the weighted average TP rate of 0.79 suggests that 79 per cent of SME applicants who were actually classified as suitable were also predicted by the CHAID model as suitable. Conversely, the false positive rate of 0.22 indicates that 22 per cent of SME applicants whose actual classification was suitable were incorrectly predicted as unsuitable by the model.

Similarly, from the table, the weighted average precision value of 0.79 indicates the proportion of SMEs that the model correctly classified as belonging to either the ‘suitable’ or ‘unsuitable’ category among all SMEs it assigned to those categories. In practical terms, if the model predicts 100 SME applicants as suitable, the precision value shows how many of those 100 belong to the suitable class. Thus, it reflects the frequency with which the model’s positive predictions are accurate and is commonly referred to as a measure of exactness (Vujović, 2021). Conversely, recall which is also known as the true positive rate, measures how many of the actual positive instances (i.e., SMEs truly in the suitable class) were correctly identified by the model. The recall value of 0.79 in this context suggests that 79 per cent of SMEs that were truly suitable were successfully captured by the model.

Both precision and recall are essential metrics for evaluating the effectiveness of classification models, particularly in imbalanced datasets or high-stakes decisions, as they provide complementary insights into the model’s predictive reliability. To capture the trade-off between precision and recall, the F-measure (or F1-score) is employed. This metric represents the harmonic mean of precision and recall, offering a single measure that balances both. In this study, the F-measure value of 0.79 reflects the model’s overall classification accuracy by integrating both its exactness and completeness (Vujović, 2021).

**Table 8.4 Confusion Matrix for CHAID Algorithm**

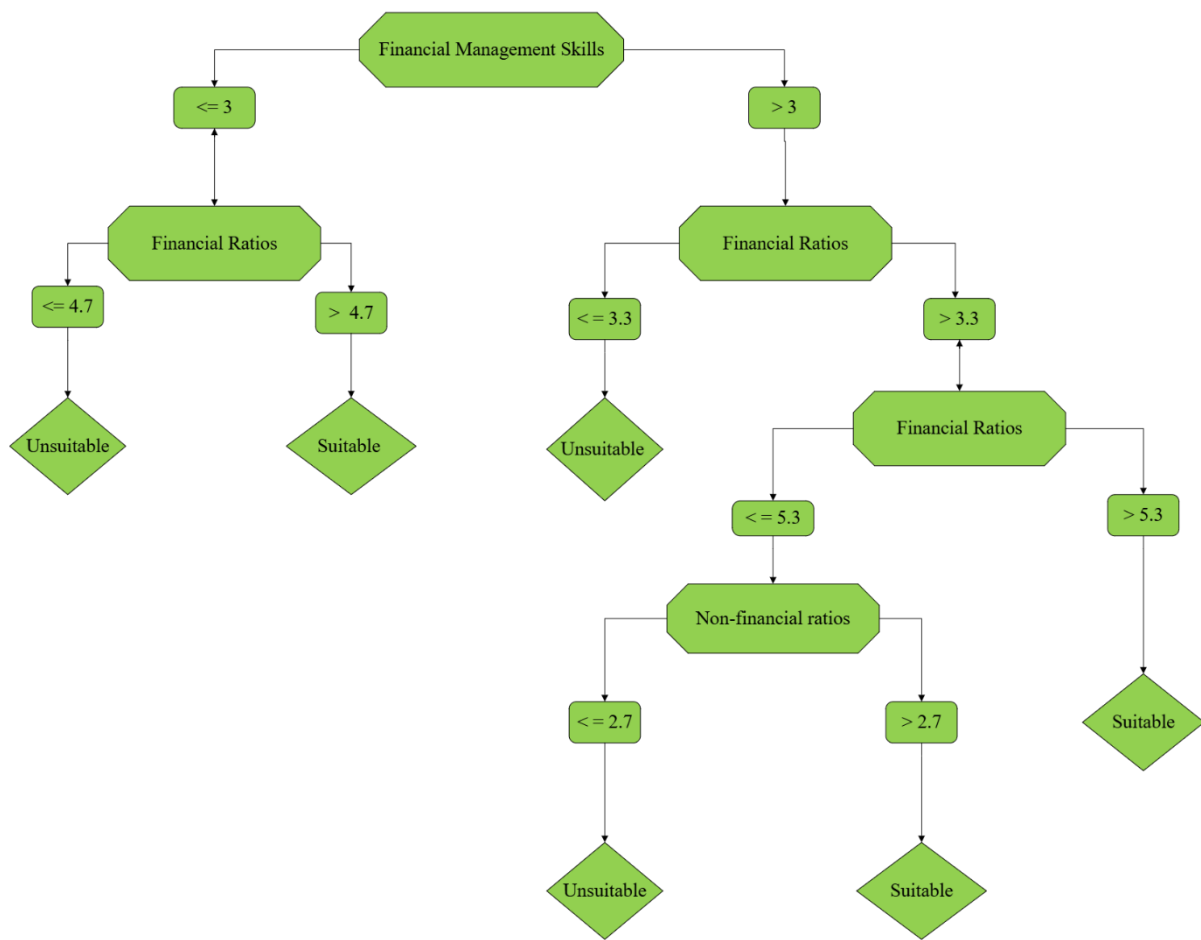
<b>Suitable</b>	<b>Unsuitable</b>	<b>Classified As</b>
110	40	<b>Suitable</b>
25	128	<b>Unsuitable</b>

The confusion matrix is a critical component of classifier evaluation, offering a more detailed and comprehensive assessment of model performance. As the name suggests, it provides insights into where the model may become ‘confused’ in differentiating between classes. It is particularly useful for analysing the model’s ability to correctly classify instances of different categories and to identify the specific types of classification errors made (Sharma and Jain, 2013). In the current study, the confusion matrix reveals that 110 SME applicants whose actual

class is suitable were correctly classified as suitable, while 40 applicants who are in fact unsuitable were incorrectly classified as suitable. This results in a correct classification rate of over 73 per cent for the suitable class. Similarly, 128 SME applicants whose actual class is unsuitable were correctly classified as unsuitable, while 25 applicants who are suitable were misclassified as unsuitable. This yields an accuracy rate of over 84 per cent for the unsuitable class.

Overall, the confusion matrix suggests that the model demonstrates strong discriminatory power, with a combined classification accuracy exceeding 78 percent for both classes. This indicates that the model is proficient at identifying and correctly classifying both suitable and unsuitable SME applicants for the use of Islamic participatory modes of financing. Moreover, one of the key strengths of decision tree algorithms, and a major reason for their popularity in machine learning applications, lies in the interpretability and transparency of their outputs. The structure of the decision tree, as generated by the CHAID algorithm, allows for a clear visual representation of how decisions are made. The tree is constructed based on the statistical significance and associative strength of the input variables with the target (dependent) variable. The figure below presents the visualised decision tree produced by the CHAID algorithm, based on the mean scores of the participating SME applicants.

**Figure 6: Decision tree based on the Mean Scores**



From the visualised CHAID decision tree, it is evident that the root node, or the topmost decision point, is the variable representing the financial management skills of the SME entrepreneur. This implies that, among all the predictor variables employed in this model, financial management skills emerged as the most significant discriminator between suitable and unsuitable SME applicants, thereby serving as the primary criterion for Islamic financial institutions when considering the suitability of applicants for participatory modes of financing. The structure of the tree reveals further decision pathways. When the financial management skills score is greater than 3, the next most informative variable used for further classification is the financial ratios variable. This composite indicator includes the solvency ratio, operating leverage ratio, and financial leverage ratio, all of which reflect the financial health of the enterprise.

Conversely, when the financial management skills score is less than or equal to 3, the model still identifies financial ratios as the next best variable for classification. If at this point the financial ratios are also less than or equal to 4.7, the model classifies the SME applicant as unsuitable for Islamic participatory financing. This suggests that a combination of low financial management competence and weak financial structure significantly reduces the likelihood of

success under equity-based Islamic finance schemes. However, if the financial ratios are greater than 4.7, despite the lower financial management skills, the model classifies the applicant as suitable for participatory financing. This implies that strong financial fundamentals may, to some extent, compensate for lower financial management competencies when assessing eligibility for Islamic participatory financing.

Furthermore, when the financial management skills of the SME entrepreneur are greater than 3 at the first decision level, and the financial ratios are less than or equal to 3.3 at the second level, the model classifies the applicants in this category as unsuitable for the use of Islamic participatory modes of financing. However, when the financial ratios are greater than 3.3 at the second level, the model proceeds to evaluate the financial ratios again at a third decision level. At this point, If the financial ratios are greater than 5.3, the candidates are classified as suitable for participatory financing and if the financial ratios are less than or equal to 5.3, the model introduces an additional variable i.e., the non-financial ratios, which is a composite non-financial variable and it includes key demographic and firm-level factors such firm age, ownership status, respondent's age, years of business experience, educational level and gender. At this decision node, when the non-financial ratios score is less than or equal to 2.7, the candidates are classified as unsuitable, suggesting a weaker profile for participatory financing. Conversely, when the non-financial ratio score is greater than 2.7, the applicants are classified as suitable, indicating that favourable demographic and firm-level characteristics can support the case for equity-based Islamic financing, even when financial indicators are moderate.

Based on the constructed decision tree, three out of the six input variables were actively utilised in the classification process. The variables that were excluded from the tree construction include including entrepreneurship skills, knowledge level, and willingness to use Islamic participatory modes. The exclusion of these variables suggest that they do not exhibit a sufficiently strong degree of association with the dependent variable and therefore were not selected by the CHAID algorithm model. The decision tree consists of over seven terminal nodes (also referred to as leaves), and a total of twelve nodes overall. This structure reflects the depth and complexity of the model's iteration during tree construction and provides insight into the size and granularity of the decision rules derived from the data. In summary, the model demonstrates a layered evaluation process, where strong financial management skills, robust financial ratios, and supportive non-financial attributes collectively contribute to identifying SME applicants who are well-suited for Islamic participatory modes of financing.

## 8.7.2 Decision Tree based on Factor Scores

Factor scores are among the most widely utilised scoring methods, particularly when further statistical analysis is conducted on the measured variables. A factor score represents a composite (latent) value that reflects each subject's position on a given factor (Thompson, 2004; Wells, 1999; Odum, 2011). According to Odum (2011) there are numerous methods available for calculating factor scores. However, in this research, the Thompson method, also referred to as the Thurstone regression method, has been employed for estimating factor scores. This estimation technique produces standardised, non-centred factor scores, thereby enabling meaningful comparison across multiple factors. The subsequent analysis has been conducted using the scores derived through this method, providing a robust basis for model training and evaluation.

**Table 8.5 Classification base on Factor scores**

<b>Algorithms</b>	<b>Accuracy</b>			<b>Precision</b>			<b>Recall</b>			<b>F-Measure</b>		
	Train	CV	Split	Train	CV	Split	Train	CV	Split	Train	CV	Split
<b>CART</b>	0.75	0.71	0.77	0.78	0.71	0.79	0.75	0.71	0.77	0.74	0.71	0.77
<b>CHAID</b>	0.79	0.72	0.75	0.79	0.72	0.78	0.79	0.72	0.75	0.79	0.71	0.75
<b>C5.0</b>	0.75	0.70	0.70	0.79	0.70	0.72	0.75	0.70	0.70	0.74	0.69	0.70
<b>REPTree</b>	0.76	0.70	0.65	0.78	0.70	0.69	0.76	0.70	0.65	0.75	0.70	0.65

From the above table, it is evident that under the cross-validation test option, the CHAID algorithm achieved the highest classification accuracy of 0.72 or 72 per cent. This is followed closely by the CART algorithm with 0.71 or 71 per cent, while the C5.0 and REPTree algorithms both recorded an accuracy of 0.70 or 70 per cent in classifying the research participants. A similar performance trend is observed across the precision, recall, and F-measure metrics, where the CHAID algorithm once again leads with a precision and recall of 72 per cent, and an F-measure of 71 per cent, matched by the CART algorithm in some respects. Following CHAID, the performance ranking for these metrics' places CART second, REPTree third, and C5.0 in the fourth position. Based on the classification accuracy derived from the cross-validation test regarded as the most robust evaluation metric, the CHAID algorithm emerges as the most suitable for this research. Consequently, it has been selected as the preferred algorithm to classify the dataset and construct the decision tree based on participant's factor scores.

**Table 8.6 Results of CHAID Classifier Algorithm**

Number of leaves	5					
Size of the tree	9					
Time taken to build the Model	0	%				
Correctly classified instances	219	72.0995				
Incorrectly classified instances	85	27.9605				
<b>Detailed Accuracy by Class</b>						
	TP Rate	FP Rate	Precision	Recall	F-measure	Class
	0.78	0.34	0.7	0.78	0.74	<b>Suitable</b>
	0.66	0.22	0.75	0.66	0.7	<b>Unsuitable</b>
<b>Weighted Average</b>	0.72	0.28	0.72	0.72	0.72	

Based on the above results, 219 instances out of a total of 304 were correctly classified, representing an overall classification accuracy of approximately 72 per cent. This figure accounts for correct predictions in both classes suitable and unsuitable. Conversely, 85 instances were incorrectly classified, amounting to approximately 28 per cent of the dataset. In terms of detailed accuracy by class, the weighted average values indicate that the true positive rate (TPR) also referred to as recall is 0.72 or 72 per cent, signifying the proportion of SMEs that were accurately classified into their actual categories. The false positive rate (FPR) is 0.28 or 28 per cent, indicating the proportion of SMEs that were misclassified i.e., those whose actual class was unsuitable but were predicted as suitable, or vice versa. This rate aligns closely with the percentage of overall misclassifications. Finally, the F-measure, which is the harmonic mean of precision and recall, is 0.72 or 72 per cent. This metric provides a balanced assessment of the model's accuracy, particularly when there is an uneven class distribution, and is a crucial indicator of the model's classification performance.

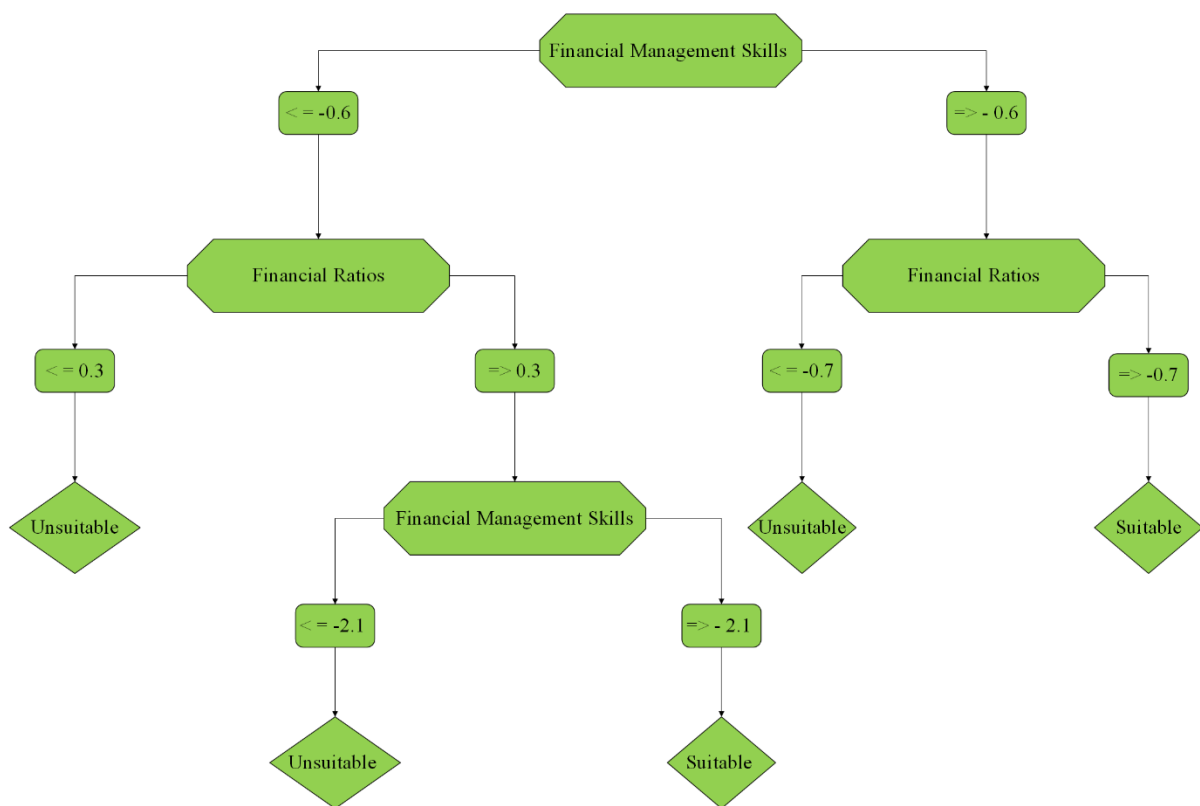
**Table 8.7 Confusion Matrix for CHAID Algorithm**

<b>Suitable</b>	<b>Unsuitable</b>	<b>Classified As</b>
118	33	<b>Suitable</b>
52	101	<b>Unsuitable</b>

The confusion matrix provides a detailed breakdown of classification performance by class. According to the results presented above, the model correctly identified and classified 118 instances that belong to the suitable class, while 33 instances that are suitable were

misclassified as unsuitable, indicating instances where the model encountered confusion. This yields an accuracy rate of approximately 78 per cent in correctly identifying and classifying suitable SME applicants as suitable for the use of Islamic participatory modes of financing. Similarly, for the unsuitable class, the model correctly identified and classified 101 instances as unsuitable, while 52 instances that belong to the unsuitable class were misclassified as suitable. This results in an accuracy of approximately 82 per cent in identifying and classifying BAD SME applicants. The visual representation of these classification results, as derived from the CHAID algorithm, is presented below in the form of a decision tree diagram, offering an intuitive and interpretable summary of the model's classification logic.

**Figure 6: Decision Tree based on the Factor Scores**



From the decision tree diagram above, the financial management skills variable emerges as the most significant input attribute in discriminating between SME applicants and is therefore placed at the root node. The results indicate that when financial management skills are less than or equal to -0.6, the next most relevant variable in the decision-making process for determining eligibility for Islamic participatory modes of financing is the financial ratios attribute. Similarly, when financial management skills are greater than -0.6, the financial ratios variable again appears as the next best discriminator at the second level of the tree. At the second level, if financial ratios are less than or equal to 0.3, SME candidates falling into this category are

classified as unsuitable, indicating they are unsuitable for Islamic participatory financing. However, if financial ratios exceed 0.3, the model again evaluates the financial management skills at a deeper level. If, at this third level, financial management skills are less than or equal to -2.1, the candidates are still classified as unsuitable. Conversely, if financial management skills are greater than -2.1, these candidates are classified as suitable, indicating suitability for participatory financing.

On the other path of the tree, when financial management skills exceed -0.6 at the first level and financial ratios are less than or equal to -0.7, the candidates are classified as unsuitable. However, if financial ratios are greater than -0.7, those candidates are deemed suitable for the use of Islamic participatory modes. This decision tree utilises only two out of the six predictor variables including financial management skills and financial ratios indicating that these variables have the strongest association and predictive significance with respect to the target (dependent) variable. The tree structure includes five terminal nodes (leaves) and a total of nine nodes, reflecting the depth of model iteration and the overall complexity or size of the generated tree.

Looking at both the mean score and factor score decision trees, an interesting observation in the analysis is that financial ratios, although identified as the strongest predictor in the regression model (with the highest standardised coefficient of 0.53), do not appear at the root node of the decision tree model. Instead, financial management skills form the initial split. This distinction arises due to fundamental differences between regression and decision tree methodologies. While regression analysis assesses the global relationship between independent variables and the dependent variable across the entire dataset estimating the strength and direction of these relationships, decision trees operate on a local and hierarchical basis, selecting variables that provide the greatest improvement in class separation at each node. Therefore, a variable like financial management skills may produce a cleaner or more efficient initial split of the data, even if its overall predictive strength is lower. Additionally, decision trees are sensitive to specific threshold values, that is a variable with high predictive power may not be selected early if its value distribution does not allow for a high-purity split at the top level. This explains why financial ratios, despite their global predictive importance, appear later in the decision tree, where they contribute significantly to refining predictions after the data has already been segmented by another variable. This reinforces the complementary value of using both regression and decision tree models to gain a more nuanced understanding of the

factors influencing Islamic Financial Institutions' decisions to adopt participatory financing modes.

**Table 8.8 Decision Rules Generated from CHAID Algorithm Mean Scores**

No.	Rule	Predicted Class
1	If FMS ≤ 3, FR ≤ 4.7	Unsuitable
2	If FMS ≤ 3, FR > 4.7	Suitable
3	If FMS > 3, FR ≤ 3.3	Unsuitable
4	If FMS > 3, FR > 3.3, FR > 5.3	Suitable
5	If FMS > 3, FR > 3.3, FR ≤ 5.3, NFR ≤ 2.7	Unsuitable
6	If FMS > 3, FR > 3.3, FR ≤ 5.3, NFR > 2.7	Suitable

The CHAID algorithm identifies the most statistically significant variables for classifying SMEs as suitable or unsuitable. The model uses three predictors, Financial Management Skills (FMS), Financial Ratios (FR), and Non-Financial Ratios (NFR), to generate six mutually exclusive classification rules. These rules reveal the hierarchical structure of decision-making and the relative importance of each predictor in determining SME suitability. Overall, the rules demonstrate that Financial Management Skills (FMS) is the most powerful predictor, followed by Financial Ratios (FR), while Non-Financial Ratios (NFR) function as a secondary refining variable.

**Table 8.9 Decision Rules Generated from CHAID Algorithm Factor Scores**

1	If FMS ≤ -0.6, FR ≤ 0.3	Unsuitable
2	If FMS ≤ -0.6, FR > 0.3, FMS ≤ -2.1	Unsuitable
3	If FMS ≤ -0.6, FR > 0.3, FMS > -2.1	Suitable
4	If FMS > -0.6, FR > -0.7	Unsuitable
5	If FMS > -0.6, FR ≤ -0.7	Suitable

Factor scores allow for more nuanced differentiation between SMEs compared to raw mean scores, highlighting subtle differences in the predictor variables. The CHAID factor score analysis confirms and extends the findings from mean-score rules. The above table shows the distinct decision rules generated from the classification results of the algorithm. These decision rules are to be considered as indicative and not absolute, as they should be read in conjunction with other decisional factors, including but not limited to the traditional financing due diligence.

## 8.8 Conclusion

This chapter captures the second empirical examination of the research data using advanced data mining technique such as classification, to classify SMEs for Islamic participatory financing modes using two widely accepted scoring methodologies including the mean scores and factor scores. The analysis revealed that the model based on mean scores outperformed the factor score model in terms of classification accuracy, precision, recall, and F-measure. Specifically, the CHAID algorithm achieved approximately 78 per cent accuracy with the mean scores compared to 72 per cent with the factor scores, indicating a stronger predictive capability when using mean score variables. The mean score-based decision tree was also more complex, incorporating seven terminal nodes and twelve total nodes, while the factor score model generated a simpler tree with five terminal nodes and nine total nodes. Across both models, financial management skills consistently emerged as the most influential predictor, positioned at the root node of the decision trees. This highlights the central role that the entrepreneur's financial literacy and management ability play in determining their appropriateness for Islamic participatory financing. Financial ratios, encompassing solvency, leverage, and operational metrics, were the next most important factors, emphasising the significance of sound financial health in IFI's evaluation for participatory modes. Additionally, the mean score model incorporated non-financial ratios such as gender, education level, business experience, respondent's age, and firm characteristics, suggesting these attributes also contribute to financing decisions but to a lesser extent.

The confusion matrices further supported the effectiveness of the CHAID model, demonstrating the capacity to correctly classify a substantial proportion of suitable and unsuitable SME applicants, with slightly higher accuracy in identifying unsuitable candidates. The interpretability of the CHAID decision trees enhances their practical utility, offering IFIs a transparent and data-driven framework for decision-making that balances predictive accuracy with ease of understanding. Overall, the findings indicate that financial management skills and financial ratios are key determinants in assessing SME eligibility for Islamic participatory financing. The superior performance of the mean score-based model suggests that detailed, item-level data may provide richer insights than composite factor scores in this context.

## CHAPTER 9

### DISCUSSIONS ON THE RESEARCH RESULTS

#### 9.0 Introduction

Having presented the results of the analyses of the research data in the preceding sections. This chapter seeks to interpret and contextualise the results of the study considering the existing literature, theoretical frameworks, and the socio-economic realities of SMEs. The discussion was systematically done by firstly analysing the findings of the socio-demographic features of the respondents as reported under the descriptive statistics, this is followed by an analysis of the psychometric findings derived from regression models, and subsequently, the results obtained from data mining techniques, specifically decision tree classification. The chapter also highlights the testing of the research hypotheses, comparison of the empirical results and concludes with a summary of the key findings.

#### 9.1 Discussions on Result of Descriptive Statistics

##### 9.1.1 Socio-demographic features of SME Entrepreneurs

The findings of this study reveal that over 74 per cent of the research respondents were male. This outcome is consistent with a substantial body of literature highlighting the significant barriers women face in accessing finance, which is an essential enabler for establishing and sustaining small and medium enterprises (Blanchflower et al, 2003; Koko et al, 2017; Wellalage and Thrikawala, 2021). For example, Asiedu et al (2012) found that women-owned businesses are more likely to face discrimination in loan approvals, while Alberto et al (2013) observed that they often pay higher interest rates compared to male-owned businesses. Consequently, limited access to formal credit has contributed to the underrepresentation of female entrepreneurs in SME creation and survival (Bardasi et al, 2011; Hertz, 2011). Furthermore, socio-cultural and religious factors also play a significant role in limiting female participation in entrepreneurial activities. Cultural norms such as early marriage, prevailing male dominance, limited access to formal education, and restricted mobility due to religious beliefs particularly in societies that strictly adhere to conservative religious principles, further constrain women's active involvement in SMEs (Aliyu et al., 2019; Idris and Agbim, 2015). Given that The Gambia is a predominantly Muslim country, the male-dominated composition

of SME respondents in this study is therefore consistent with the broader socio-cultural and religious context.

Regarding the age distribution of respondents, the findings reveal that individuals aged between 31 and 50 years constitute over 82.6 per cent of the total sample. This age concentration may reflect broader socio-economic realities in developing and emerging economies, where many able-bodied individuals resort to SME operations as a means of employment or as a coping mechanism against unemployment and redundancy. This observation aligns with previous research. For instance, Secka et al (2023) reported that SMEs in The Gambia provide employment to over 60 per cent of individuals within the 15 to 64 age group. Similarly, Al Balushi et al (2018) also found that more than 87 per cent of SME respondents in their study were between the ages of 20 and 40. Furthermore, the national statistic of The Gambia supports this trend. For instance, according to The Gambia Data Portal, the composite measure of labour underutilisation for youth aged 15 to 35 stood at 48.6 per cent as of 2023 (GBoS, 2024). This high rate of underemployment suggests that a substantial portion of the youth population is likely to engage in SME activities, whether as a temporary or permanent source of livelihood.

In terms of educational attainment, the findings indicate that at least 82.7 per cent of the respondents reported having some level of formal education. This is consistent with prior studies. For instance, Jallow (2023) in a study on the role of Islamic finance in financing SMEs in The Gambia, found that 40.2 per cent of respondents held a first university degree. Similarly, Al Balushi et al (2018) reported that approximately 65 per cent of SME respondents had completed secondary or higher diploma education, while 31.7 per cent had attained a bachelor's degree. From the perspective of financial institutions, educational attainment is often regarded as a positive indicator of creditworthiness, with business operators or managers possessing higher qualifications generally perceived as more capable of managing risks and ensuring business success (Abdulsaleh and Worthington, 2013; Zarook et al, 2013). Additionally, according to The Gambia Bureau of Statistics (GBoS, 2024) the national literacy rate stands at 62.9 per cent. Given this context, it is unsurprising that most respondents in this study have achieved some form of formal education.

Regarding SME ownership status, an overwhelming majority of respondents that is 98.7 per cent reported that their businesses are operated either by the sole owner or by a part-owner. This high prevalence of owner-managed enterprises suggests that many SME operators rely heavily on their businesses as their primary means of livelihood, often in the absence of

alternative income sources. This finding aligns with numerous empirical studies highlighting the critical role of SMEs in providing employment, particularly for displaced workers, recent graduates, and economically active individuals seeking sustainable income (World Bank, 2022; Muriithi, 2017). In many cases, the economic activities underpinning SMEs are characterised by low profit margins, making owner-operation the most viable option due to cost-efficiency. Furthermore, issues related to trust and reliability in business relationships may compel owners to retain direct managerial control, thereby minimising the risk of mismanagement or opportunistic behaviour. This may explain why only 1.3 per cent of SMEs in the study were reported to be managed by employees rather than the owners themselves.

Given that SME operations often serve as the primary source of livelihood for many entrepreneurs, it is expected that the age of the business operator would exhibit a linear relationship with years of business experience. This expectation is reinforced by related findings in this study concerning the respondent's age, ownership status, and educational attainment. It is therefore unsurprising that over 39.2 per cent of the respondents reported having operated their businesses for at least 10 years or more. This suggests that SME activity frequently becomes a viable alternative for individuals who are either unable to secure formal employment in their desired professions or lack any other source of income. This finding aligns with prior research such as Ed Vos et al (2007) who reported that over 47.4 per cent of their SME respondents had been in operation for more than five years. Moreover, SMEs with extended years of operation may be well-positioned to benefit from the Islamic participatory financing models. Operators with long-standing business experience are likely to possess a deeper understanding of their industries, along with honed entrepreneurial skills and management capabilities traits that align with the principles of risk-sharing and partnership intrinsic to Islamic participatory financing.

### **9.1.2 Firm Level Features**

The findings on business sectoral distribution reveal that retail trading is the dominant sector among SMEs in this study, accounting for over 44 per cent of respondents. This is not unexpected, given The Gambia's heavy reliance on imports. The data show that only 3.2 per cent of SMEs are engaged in the manufacturing sector. According to recent statistics from The Gambia Bureau of Statistics (GBoS, 2024) the total value of imports in 2022 stood at USD 751,905,000.00, while exports accounted for only USD 21,603,000.00 resulting in a trade deficit of approximately USD 730,302,000.00. This economic structure inherently favours trading activities over productive sectors like manufacturing. These findings are consistent with

those of Al Balushi et al (2018) who similarly reported that over 45.2 per cent of their SME respondents operated within the trade sector. Retail trading tends to be more accessible due to its relatively low entry barriers, minimal requirement for specialised skills, and reduced capital intensity compared to other sectors such as agribusiness, services, or manufacturing (Diabate et al, 2019; Abor, 2007).

By contrast, manufacturing and agricultural enterprises typically demand more substantial capital investment, technical skills, and asset-based operations, which may explain their limited representation among SMEs in The Gambia. This limited engagement in the manufacturing sector, however, presents a significant opportunity for Islamic participatory financing. Modes such as *Musharakah Mutanaqisah* and *Musharakah* could play a crucial role in supporting SME growth in capital-intensive sectors by facilitating joint ownership of assets and risk-sharing in equipment acquisition and raw material sourcing. Likewise, *Mudarabah* financing where capital is provided by the financier and entrepreneurial effort by the SME, holds strong potential to promote development in the service sector, where skill and innovation are often the primary inputs.

The results of the study indicate that SMEs employing between one and five individuals constitute approximately 65.9 per cent of the total respondents. More broadly, SMEs with ten or fewer employees collectively represent over 87.4 per cent of the sample. This distribution suggests that many SMEs in the study are micro- to small-sized enterprises, likely reflecting the nature of their operations, which are predominantly in low-capital, low-labour sectors such as retail trading and services. These sectors typically require fewer personnel to manage the day-to-day operations and do not necessitate large-scale employment structures. Moreover, many SME operators in developing and emerging economies, including The Gambia, often engage in business activities without a long-term entrepreneurial vision, but rather as a temporary means of livelihood.

For graduates and unemployed individuals, SME operation often serves as a stopgap in the absence of formal employment opportunities, while for retirees or those lacking alternative income sources, it becomes a mode of sustenance. As a result, the businesses are frequently managed with minimal staffing and limited aspirations for expansion. In the context of The Gambia's import-dependent economy, this trend is further reinforced. The prevalence of trade-based SMEs reduces the demand for labour-intensive operations, in contrast to manufacturing-oriented businesses, which inherently require more employees for production, logistics, and

operations. Consequently, the structural nature of the economy shapes both the size and staffing patterns of SMEs, contributing to the observed employment distribution.

Based on the research findings, over 82 per cent of the respondents originate from two main administrative regions i.e., the Kanifing Municipal Council and the Brikama Area Council. This concentration can be attributed primarily to two interrelated factors including population density and the prevalence of financial institutions. It is reasonable to assert that regions with higher population densities are more likely to serve as hubs for economic activities, including SME operations (Al-Jebouri et al, 2022; Liu et al, 2023). According to The Gambia Bureau of Statistics (GBoS, 2024) these two regions collectively account for approximately 63.4 per cent of the national population, making them the most demographically significant areas in the country. Therefore, the overrepresentation of respondents from these regions is consistent with demographic and economic expectations. Furthermore, these regions together with Banjul constitute the urban settlement of the country.

This finding aligns with those of Secka et al (2023) who reported that Brikama and Kanifing together accounted for over 70 per cent of SMEs in their study representing 37 per cent and 33 per cent respectively. Additionally, the location of SMEs is closely tied to the accessibility of financial services, which play a critical role in their establishment and sustainability (Berger and Udell, 2006; Fatoki and Asah, 2011). In The Gambia, most commercial bank branches are located within these two populous regions (urban area), thereby enhancing geographical proximity and increasing access to credit facilities. This proximity also facilitates the gathering of ‘soft information’ by lending institutions such as personal knowledge of the borrower and their business practices which has been shown to be crucial in promoting lending to SMEs (Reuben Kira and He, 2012).

## **9.2 Discussion on Psychometric Regression Models**

### **9.2.1 Firm Performance Models**

The results of Models 1 and 2 represent the first stage in evaluating SMEs for the Islamic participatory modes of financing by Islamic Financial Institutions, with a specific focus on measuring firm performance. Model 1 uses firm-level and some entrepreneur’s attributes as predictors, while Model 2 extends this by including qualitative (psychometric) attributes. In Regression 1, the results indicate that firm age has a positive but statistically insignificant relationship with firm performance. This positive association aligns with both theoretical reasoning and several empirical studies, suggesting that older firms may benefit from

accumulated experience and established market presence, which can enhance performance. Conversely, younger firms often face challenges stemming from limited experience. This finding is consistent with the works of Mgeni and Nayak (2016) Kipsha, (2013) and Mothibi (2015) all of whom reported a positive link between firm age and performance.

However, it contrasts with studies such as Dogan (2013) who found a negative relationship, possibly due to older firms being more resistant to innovation and change, which could hinder their adaptability in dynamic market environments. The positive association between firm age, respondent's age, years of business experience, and firm performance observed in this study may also be attributed to the fact that over 52.1 per cent of the respondents reported having at least nine years or more of experience in their line of business. Such extensive experience likely serves as a strong foundation for effective business decision-making and operational efficiency, thereby contributing to enhanced firm performance.

Furthermore, results indicate that the business sector in which a firm operates does not exert a statistically significant influence on performance outcomes. In practical terms, firms in different sectors (i.e., retail or non-retail) show negligible differences in performance scores after controlling for other variables such as solvency ratio, operating leverage, firm age, and educational level. This aligns with empirical work showing that in emerging and developing economies, firm-level capabilities and financial resilience often overshadow sectoral effects in predicting performance (Carvalho and Schiozer, 2015; Hitt et al, 2016).

Results also indicate that, the location of business (i.e., urban or rural) was also found to have a negative insignificant relationship with firm performance. This result is quite expected as geographical disparity in terms of infrastructure, market access, and institutional support etc is expected to greatly influence performance (Porter, 2003; Fingleton and McCombie, 1998). The small negative coefficients in this study suggest that this difference is not material enough to cause a difference in firm performance after controlling for other variables. This aligns with the findings of Phillipson et al (2019) who reported that although urban and rural SMEs report similar turnover, but urban SMEs are more likely to report a profit.

Results from Regression 1 reveal that the number of employees within an SME has a negative and statistically insignificant relationship with firm performance. This finding is somewhat unexpected, as the number of employees is often used as a proxy for firm size, which under normal circumstances is anticipated to have a positive correlation with performance. A larger workforce is typically associated with improved productivity, potential economies of scale, and

greater operational efficiency (Bhalla et al, 2022). However, this assumption is more applicable to large and formally structured enterprises. In the context of SMEs, particularly within closely knit and religious societies such as The Gambia, the employment dynamic may differ. SME owners may hire additional staff not purely based on operational need, but rather as a social obligation to support unemployed family members, relatives, or acquaintances. This informal approach to hiring may result in overstaffing or inefficiencies, thereby weakening the expected positive impact on firm performance. For example, a graduate struggling to find employment may be absorbed into a relative's SME, not out of business necessity, but as a form of economic support. This interpretation is supported by studies such as Becker-Blease et al (2010) Tanui and Serebemuom, Serebemuom (2021) and Azhar and Ahmed (2019) who have identified similar patterns in SME employment practices. However, it stands in contrast to the broader body of empirical research that establishes a positive relationship between firm size (as measured by employee count) and firm performance (Niresh and Thirunavukkarasu, 2014; Ozugulbas et al, 2006; Kobayashi et al, 2018; Kampkötter et al, 2023).

The ownership status of the SME operator has been found to be positively correlation with firm performance although not significant. The nature of ownership and management has long been theorised to affect firm performance. In fact, the literature on agency theory, stewardship theory, and the resource-based view (RBV) have well documented that the identity of the individual who operates or manages an SME, has a measurable impact on firm performance (Jensen and Meckling, 1976). Empirical evidence suggests that the closer the operator's identity is to full ownership, the better the SME's performance tends to be. Owner-managed SMEs often outperform non-owner managed due to lower agency costs and stronger stewardship (Chrisman et al, 2004). The result in this study is consistent with this. In fact, in this study, only 1.3 per cent of the SMEs are operated by an employee, the rest are either operated by full or part-owner. Similarly, operator's age and years of business experience have a had positive and insignificant relationship with firm performance. Both results show a weak effect on performance albeit positive correlation. Similar results have been reported by (Zhao, 2021; Radipere, 2014).

The results further indicate that the educational level of the SME operator has a positive but statistically insignificant relationship with firm performance. This finding suggests that while education is a relevant factor in SME success, its impact may be limited unless complemented by practical business experience. The positive coefficient implies that higher education enhances an entrepreneur's ability to understand and manage complex business dynamics,

adapt to change, and implement effective decision-making. In today's increasingly competitive and fast-evolving business environment, such cognitive and analytical skills are critical for sustainable performance, particularly within SMEs. In this study, 82.7 per cent of the respondents reported having attained some level of formal education, and 21.7 per cent had obtained a university degree. These findings align with prior research, which also identified a positive though not always statistically significant relationship between education and SME performance (Essel et al, 2019; Hashim et al, 2018; Vasan, 2020). The evidence reinforces the idea that while education equips entrepreneurs with valuable skills, it must often be contextualised through experience and relevant business acumen to produce measurable improvements on firm outcomes.

Regarding gender, the analysis revealed that, taking male entrepreneurs as the reference category, female SME operators are 14 per cent less likely to positively influence firm performance. This disparity is consistent with the structural and institutional challenges that women face in entrepreneurial ecosystems, particularly in access to financing, formal business networks, and ownership rights. Gender-based socio-cultural norms, especially in patriarchal and religious societies, often hinder women's active participation and success in business. This result is supported by findings from Wellalage and Thrikawala (2021) Aliyu et al (2019) who similarly observed that gender-based constraints can negatively influence women's entrepreneurial success.

It is a common and well-established practice to use financial ratios rather than raw financial statement figures to evaluate firm performance, as ratios provide standardised and comparable metrics across firms of different sizes and sectors (Delen et al, 2013; Yousaf and Kumar Dey, 2022). In line with this, Model 1 in this study incorporates key financial ratios such as solvency, operating leverage, and financial leverage, all of which demonstrated a positive relationship with firm performance. The solvency ratio plays a critical role in assessing a firm's ability to meet its long-term financial obligations and is therefore an important indicator of financial stability and creditworthiness. From a financing perspective, especially within the context of the Islamic participatory finance where the risk-sharing principle is central, firms with higher solvency ratios are perceived as less risky and more sustainable in the long term. According to the risk-return trade-off principle, lower financial risk as indicated by a healthy solvency ratio, should logically correlate with improved firm performance.

Thus, the positive relationship between solvency and firm performance found in this study is consistent with several previous empirical works (Habibi and Iqbal, 2021 ; Yu and Wenjuan,

2010; Borhan et al, 2014; Ali and Faisal, 2020; Minnema and Andersson, 2018). These studies underscore the idea that firms with solid solvency profiles are more attractive to financiers and better positioned to sustain operations, thereby enhancing performance. However, this finding stands in contrast with results from some other studies (Khidmat and Rehman, 2014; Kyule, 2015) which reported a negative relationship between solvency and profitability. Such discrepancies may stem from industry-specific factors, capital structure strategies, or macro-economic conditions that mediate the effect of solvency on firm outcomes.

The operating leverage ratio measures the extent to which a firm's income growth is driven by revenue growth, serving as an indicator of how fixed costs impact profitability (Yinusa et al, 2021). In other words, it assesses a firm's cost structure by evaluating the proportion of fixed operating expenses that remain constant regardless of changes in production or sales volume. A positive operating leverage ratio suggests that the firm can increase its sales volume without a proportional increase in operating costs, thereby improving profit margins. From the perspective of investors and financiers, such a scenario represents a favourable opportunity for return on investment, as it reflects operational efficiency and cost control.

In this study, the positive operating leverage ratio of 0.30 or 30 per cent observed among the sampled SMEs may be largely attributed to the high concentration of over 63.1 per cent of businesses in the retail trading and services sectors. These sectors typically operate with relatively stable and predictable fixed costs, such as rent and utilities, making them more likely to benefit from higher operating leverage. This finding aligns with the conclusions of prior studies, including those by Naseem et al (2012) Grau and Reig (2021) and Chen et al (2019) all of whom highlight the positive relationship between operating leverage and firm performance. However, the result stands in contrast with other studies such as Asraf (2020) Tayyaba (2013) and Balyaminu (2017) who found a negative or insignificant relationship between operating leverage and profitability. Such discrepancies could be influenced by differences in sectoral focus, firm size, or market dynamics, especially in less stable economic environments where fixed costs become a liability during downturns in revenue.

Financial leverage pertains to a firm's capital structure, focusing specifically on the extent to which a firm's assets are financed through borrowed funds (debt) as opposed to equity. It is a critical component of financial decision-making for SME operators and finance managers, as it carries a double-edged effect, while appropriate use of debt can enhance returns on equity, excessive reliance on debt can expose the firm to increased financial risk (Ogiriki et al, 2018). Therefore, determining an optimal mix of debt and equity remains a strategic imperative in

capital structure management. In this study, the financial leverage ratio of 0.01 indicates a relatively low reliance on debt financing among the surveyed SMEs. This suggests that a significant portion of the SME firm's assets are financed through equity, underscoring the common challenge that SMEs face in accessing external debt financing. This finding aligns with the conclusions of Gweji and Karanja (2014), Al-Tally (2014) and Iqbal and Usman (2018) who similarly reported low levels of debt utilisation among SMEs due to constraints such as high collateral requirements, credit risk perceptions, and lack of financial records. Conversely, the result contrasts with studies such as Putu and Putu (2015), Mahboob and Iqra (2015) and Ahmad et al (2015), who found higher debt levels in SMEs, often linked to more developed credit markets or government-backed financing schemes. The variation in findings may reflect contextual differences in the financial ecosystems across regions or countries, particularly between emerging and developed economies.

Regression Model 2 integrates both firm-level and entrepreneur-specific attributes, along with psychometric qualitative variables, to predict firm performance. The additional variables in this model include SME operator's trust, entrepreneurial skills, financial management skills, SME entrepreneur's willingness to adopt Islamic participatory financing, and knowledge level of SME operators on the Islamic finance principles and products. Among these, the results reveal that the level of interpersonal trust exhibited by SME operators has a negative and statistically insignificant relationship with firm performance.

In this study, the operator's trust is variable conceptualised and operationalised as a product of repeated social and business interactions, consistent with existing theoretical frameworks. According to Bauman and Meunier-Fitzhugh (2014) given the resource constraints typically faced by SMEs, operator's trust becomes almost indispensable for maintaining relationships with stakeholders, securing resources, and facilitating business continuity. Therefore, the negative finding is somewhat unexpected, as trust is traditionally viewed as an enabler of strategic alliances, customer loyalty, and creditor confidence which are all factors presumed to enhance firm performance. Several studies have highlighted the positive role of trust in economic exchanges. For instance, Hallin et al (2011) emphasise that trust underpins enduring relationships with suppliers and customers, while Sako (2006) and Saha and Banerjee (2015) argue that trust contributes to reduced transaction costs and improved stakeholder cooperation. However, the findings of this research align more closely with scholars such as Deakin and Wilkinson (1998) and Petrakis and Kostis (2015) who argue that empirical evidence linking trust to performance remains inconclusive. Similarly, Fukuyama (1995) notes that while a

theoretical connection between trust and business success is plausible, it lacks consistent empirical support. Thus, the negative relationship between entrepreneur levels and firm performance in this case may reflect both contextual realities and limitations in capturing complex behavioural constructs through survey-based measures.

One possible explanation for the negative association observed in this study is that SMEs especially in resource-constrained environments like The Gambia often operate with limited access to markets, clients, and financial institutions. This lack of options may compel SME operators to over-rely on a small network of stakeholders, including creditors, customers, and suppliers. As Rus and Igllic (2005) and Aulakh et al (1996) suggest, such dependency can create unbalanced power dynamics and unchecked obligations, potentially leading to costly transactions and inefficient outcomes, ultimately hampering firm performance. Dyer and Chu (2011) further posit that the impact of trust on performance is context-specific and not universally positive, which may explain the divergence between this study's results and more optimistic perspectives on trust. This suggests that in practice, trust may be context-dependent rather than universally beneficial, particularly in constrained environments where over-reliance on close networks can reduce efficiency (Fukuyama, 1995).

Unsurprisingly, the results indicate that both entrepreneurial skills and financial management skills of SME operators exhibit a positive relationship with firm performance, with the latter demonstrating a statistically significant impact. This outcome underscores the vital role that individual-level competencies play in determining the success of small business enterprises. Entrepreneurial skills represent the essential cognitive and practical tools such as innovation, opportunity recognition, and strategic thinking that empower entrepreneurs to navigate complex business environments. These skills enable SME operators to make informed, adaptive decisions, which ultimately foster improved firm performance. This finding aligns with previous studies, including Hashim et al (2018), Kabir et al, (2017), Kanaan-Jebna et al, (2022) Narkhede et al (2014) and Yani et al (2020), all of whom highlight the critical role of entrepreneurial capacity in business success.

More notably, the financial management skills emerge as a significant predictor of firm performance in this study. These skills involve the ability to design and implement effective financial control systems, collect and analyse financial data, interpret reports, and make sound financial decisions (Paarima et al, 2021). Robust financial management practices, rooted in these competencies, are crucial for the financial sustainability and operational efficiency of SMEs (Rathnasiri, 2015). SME operators equipped with strong financial acumen are more

likely to maintain accurate financial records, manage working capital prudently, make strategic investment choices, and structure financing effectively all of which serve as enablers of improved performance. The positive and statistically significant influence of financial management skills on firm performance in this study is consistent with a wide range of empirical findings, including those by (Sooriyakumaran et al, 2022; Mohammed et al, 2020; Nketsiah, 2018; Nthenge and Ringera, 2017). Collectively, these findings reinforce the conclusion that financial literacy and decision-making competence are indispensable in driving SME growth and resilience.

A fundamental tenet of Islamic participatory financing modes notably *Mudarabah* and *Musharakah*, is the sharing of profits and risks between the financier and the entrepreneur. In *Mudarabah*, profits are shared while losses are borne by the financier unless due to negligence, while *Musharakah* entails both profit and loss sharing among partners. Therefore, an SME operator's expressed willingness to adopt these financing modes reflects a preference for risk-sharing arrangements over conventional debt-based or non-participatory alternatives. However, this preference appears to contradict the conventional economic behaviour of the average businessperson, who typically seeks to privatise profits while externalising risks and losses. From a theoretical standpoint rooted in information asymmetry and moral hazard, the extant literature suggests that SMEs are more likely to opt for the Islamic participatory modes when their projects are highly uncertain, and outcomes are difficult to predict (Nouman and Ullah, 2014; Zhou and Wu, 2011; Nouman et al, 2018). This tendency is often driven not by ideological alignment with Islamic finance principles, but by strategic motivations to share risks under uncertain business conditions.

In this study, the negative relationship observed between willingness to use Islamic participatory modes, and firm performance aligns with these empirical findings. It implies that SME operators express greater willingness to adopt profit-sharing modes particularly when their businesses are underperforming or operating under higher risk, thereby potentially shifting part of the business risk to the financier. This outcome is consistent with findings by (Zhou and Wu, 2011; Nouman et al, 2018; Amrani, 2012). Conversely, it contradicts Jallow, (2023) who reported that SMEs in The Gambia showed a preference for Islamic finance products to facilitate business expansion. This result also stands in contrast to the expected behaviour of an ethically motivated Islamic entrepreneur, whose objectives may transcend short-term profitability. Rooted in the Islamic moral economy, such an entrepreneur may prioritise *Falah* (human well-being and spiritual success) through altruism, trust, and

accountability, aiming to serve the Muslim *Ummah* while seeking divine reward in the hereafter (Abdul-Rahman et al, 2014).

Finally, the results also indicate that the knowledge level of SME entrepreneurs regarding Islamic finance principles and products has a negative relationship with firm performance. While this may seem counterintuitive, as extant literature often reports a positive correlation between entrepreneurial knowledge and firm performance, this finding may be context-specific and influenced by several structural and behavioural factors within underdeveloped Islamic finance ecosystems, such as that of The Gambia. One plausible explanation is that greater knowledge of Islamic finance may lead SME entrepreneurs to adhere more strictly to Shariah-compliant principles, potentially limiting their operational flexibility.

In a nascent Islamic finance market like The Gambia, such strict adherence may inadvertently cause firms to forgo growth opportunities that do not fully align with Shariah guidelines, particularly when conventional alternatives are more readily available or practical. This phenomenon reflects the trade-off between religious compliance and market competitiveness in dual financial systems. Moreover, while knowledge is essential, it does not automatically translate into effective application. In environments where the Islamic finance infrastructure is underdeveloped i.e., characterised by limited Shariah-compliant financial products, weak regulatory frameworks, and insufficient institutional support, entrepreneurs may face structural constraints that hinder the full operationalisation of their knowledge. Thus, even well-informed entrepreneurs may find it challenging to align their firm's financial strategies with Islamic principles without compromising performance. This interpretation is supported by studies such as Al-Shammari and Salimi (2020), Omar and Atan (2015) Yusoff and Alhaji (2018), all of whom highlight the contextual limitations of Islamic finance application in emerging markets. Furthermore, Rasheed and Siddiqui (2022) and Othman et al (2023), describe knowledge in trust-based financing as a double-edged sword, suggesting that while knowledge can empower ethical financial decisions, it may also heighten risk aversion and induce opportunistic behaviour, thereby dampening firm performance in competitive markets. In sum, this negative relationship should not be interpreted as a dismissal of the value of knowledge, but rather as an indicator of the mismatch between knowledge, market maturity, and institutional support, which shapes the practical outcomes of Shariah-compliant entrepreneurial practices in the Gambian SME sector.

### **9.2.2 Operator Trust (Addressing Impending Moral Hazard issues)**

Models 3 and 4 seek to address the second step of the Islamic Financial Institution's evaluation process, which is the assessment and mitigation of moral hazard risks associated with the use of Islamic participatory modes of financing. In this context, trust in the SME operator is used as a proxy for potential moral hazard, with Model 3 predicting trust levels based on the operator's psychometric attributes, and Model 4 incorporating both firm-level and entrepreneur-specific characteristics.

The results from both models reveal that the entrepreneurial skills and financial management skills of SME operators have a positive and statistically significant impact on operator's trust levels. These findings highlight the critical role that these managerial competencies play in building confidence in the operator's ability to manage business resources ethically and efficiently. Drawing from Boyatzi's framework of managerial competencies as cited in Freitas and Odelius (2017) such skills are considered observable behaviours that drive organisational performance and contribute to achieving strategic goals. Empirical literature has long established that skills are key determinants of trust within organisational and business settings. For instance, Xu and Quaddus, (2012) and Guenzi (2010) argue that skill and competence are central to the formation of trust, particularly in dynamic business environments. Similarly, Stouthuysen et al (2017) emphasize that professional skill enhances trustworthiness in financial and strategic decision-making. In the case of SME operators, the level of business acumen, demonstrated through entrepreneurial and financial expertise, signals to financiers, creditors, and stakeholders a lower risk of opportunistic behaviour, thus mitigating moral hazard concerns.

The findings of this research align with prior studies including Leonardi (2014), Sharif et al (2021), Frazier et al (2015), Altintias et al (2024) all of whom support the premise that higher competency enhances perceived trustworthiness, particularly in relationships involving financial intermediation and shared business risk, as in the case of *Mudarabah* and *Musharakah* contracts. Therefore, these results provide important policy implications for IFIs in The Gambia and similar contexts, suggesting that beyond collateral and credit scores, evaluating SME operator skills can be an effective trust-based mechanism to alleviate moral hazard in Islamic participatory finance.

Results further indicate that the willingness of SMEs to engage with Islamic participatory modes of financing has a positive and statistically significant impact on trust level.

Traditionally, literature conceptualises trust as a precursor or antecedent to willingness, that is, individuals are more willing to adopt a system or product when they already trust it (Ahorsu et al, 2022; Ramos et al, 2018; Ramli et al, 2021; Choudhury and Shamszare, 2023). However, in this study, the relationship is analysed in reverse, with willingness to use Islamic participatory financing acting as a predictor of trust. This shift in perspective posits that willingness may signal the presence of underlying trust, whereas unwillingness may reflect distrust or hesitation. The reverse relationship observed in this study suggests that willingness may act as a signal of latent trust, particularly within religiously embedded economic systems. From a theoretical standpoint, particularly considering literature grounded in information asymmetry and moral hazard, SME operators are often reported to express willingness to adopt participatory financing when their ventures are high-risk and characterised by uncertain returns (Nouman and Ullah, 2014; Zhou and Wu, 2011; Nouman et al, 2018). This would suggest a negative relationship between willingness and trust, since willingness in such contexts may reflect opportunistic behaviour. However, the positive association observed in this research deviates from that expectation.

This unexpected result may be explained by two key contextual factors based on the socio-economic and religious context of The Gambia. First, the sectoral composition of the sample shows that most SME respondents operate in relatively low-risk sectors such as retail and services, as opposed to high-risk areas like manufacturing or agriculture. This reduces the probability that willingness is driven by the desire to shift risk to financiers. Second, the religiosity of the entrepreneur may influence both their willingness and trustworthiness. Studies have shown that religious adherence improves moral and ethical behaviour, thereby reducing the perceived risk of default and enhancing trust between financier and entrepreneur (Tepe et al, 2016). In such contexts, willingness to engage in Islamic finance may be guided more by faith-based convictions than financial opportunism, leading to a genuine signal of trustworthiness. Thus, the findings align with prior works such as Zhou and Wu (2011), Chen et al (2016), Adhikari and Agrawa (2016), Islam and Ahmad (2020), who suggest that under certain conditions such as religious commitment and sectoral characteristics, willingness to use participatory finance can positively correlate with perceived trust, especially within Islamic economic systems. Thus, the positive relationship between willingness to adopt Islamic participatory modes of financing and trust suggests that religious commitment may reinforce ethical alignment and cooperative behaviour. This supports the idea that Islamic

entrepreneurship is not purely economic, but normatively driven (Abdul-Rahman et al., 2014), as promoted by the Islamic entrepreneurship theory.

The results further reveal that the entrepreneur's knowledge level on the Islamic finance principles and products has a positive and statistically significant relationship with trust. This finding is theoretically sound, as knowledge is widely recognised as a key antecedent to trust. According to Doney et al, (1998) knowledge reduces uncertainty, and lower levels of uncertainty enhance trust. In a business context, it is reasonable to infer that the more knowledgeable an individual is in a specific domain, the more likely they are to be perceived as trustworthy and competent in fulfilling their responsibilities. Within Islamic finance, where contractual structures are complex and enforcement mechanisms may be limited, knowledge serves as a critical enabler for both compliance and confidence. This also reflects a broader structural reality in emerging Islamic finance ecosystems such as The Gambia, where trust is not only a moral construct but also an institutional substitute for weak regulatory and legal enforcement frameworks. In such contexts', informed entrepreneurs are more likely to engage credibly with financiers, thereby strengthening trust relationships. For this study, over 82.7 per cent of respondents reported receiving some form of formal education, suggesting a relatively informed respondent base. As such, the observed positive effect of knowledge on the Islamic finance principles and products on trust is both empirically and logically consistent. This finding aligns with prior research, including (Wang et al, 2009; McCole and Palmer, 2002) who similarly emphasise the trust-enhancing effect of knowledge and expertise in financial and service-based interactions.

In Model 4, the results indicate that among all the added variables, only firm age shows a significant positive relationship with operator's trust, which is used as a proxy for addressing the impending moral hazard issues in Islamic participatory financing. This finding suggests that as firms mature, entrepreneurs engage in more frequent and diverse interactions with stakeholders such as suppliers, customers, financiers, and regulators, which gradually fosters interpersonal trust. The accumulated history of these interactions likely enhances the entrepreneur's reputation, reliability, and credibility, all of which are foundational to operator's trust. This finding aligns with relational contracting theory, where repeated interactions build reputation and credibility (Baas, 2010). In the Gambian SME context, where formal credit information systems are limited, reputation accumulated through time becomes a key signalling mechanism. This result is consistent with previous studies, including Virues et al (2019), Lwango et al (2017) and Baas (2010) who argue that longer firm history contributes to

stakeholder confidence and reduces perceived risks in business relationships. Other variables in the model including the operating leverage ratio and respondent's age have exhibited positive but statistically insignificant relationships with operator's trust. These results may imply that while a firm's operational dynamics and the age of the operator can influence perceptions of reliability, but they do not independently determine trust levels in the context of SME financing through the Islamic participatory modes.

Interestingly, education level was found to have a negative insignificant relationship with operator's trust. This may indicate that formal educational attainment alone is insufficient in influencing perceptions of trustworthiness, particularly in trust-based financing mechanisms where personal integrity, historical conduct, and ethical orientation may carry more weight. The insignificant role of education in predicting trust aligns with literature suggesting that trust in business contexts is often built through experience, interpersonal relationships, capabilities, and organisational practices, rather than the formal educational background of the entrepreneur or manager. Furthermore, the model reveals that both financial leverage ratio and years of business experience have a negative relationship with trust. This is counterintuitive, especially in the case of experience, which is often associated with increased capability and reliability. A possible explanation is that longer experience may not always translate into positive stakeholder relationships, especially if it includes periods of poor financial performance, overreliance on debt, or reputational issues. Thus, Trust formation in SMEs often emerges from transparency, reliability, and demonstrated skill rather than the number of years an entrepreneur has been active in business (Dietz, 2011). Similarly, higher financial leverage could signal increased financial risk and potential default, thereby diminishing trust from financiers or partners particularly in Islamic finance, where risk-sharing and ethical financial practices are emphasised.

Taken together, these findings contribute to a more nuanced understanding of trust in Islamic financing for SMEs. In the context of The Gambia, trust must be understood not merely as an abstract behavioural construct, but as a practical response to structural constraints, including weak formal institutions, limited credit information systems, and a high reliance on interpersonal relationships in economic transactions. This means that Islamic participatory financing in The Gambia does not operate in a purely theoretical framework of moral economy. Instead, it functions within a hybrid system, where ethical values, economic constraints and social structures jointly determine behaviour.

### **9.2.3 Decision of IFIs to Use Islamic Participatory Financing Modes**

Models 5 and 6 represent the core analytical models of this research, employing multiple regression analysis to examine psychometrically, determinants of using the Islamic participatory modes of financing by Islamic Financial Institutions. In Model 5, factor scores derived from the identified variables were used as inputs in the regression model. The results reveal that entrepreneurial skills have a significant and positive relationship with the IFI's decision to use participatory modes of financing. Given that the Islamic participatory financing modes are equity-based and trust-driven, thus, returns to financiers are intrinsically linked to the actual business performance of the venture. Therefore, the adequacy and appropriateness of entrepreneurial competencies among SME operators become critical determinants for financiers when evaluating potential funding partnerships. This finding is in alignment with prior research, including Yustiardi et al (2020), Bello et al (2015), Zizile and Tendai (2018), Nakhata (2018) and Islam and Ahmad (2020) all of whom have all emphasised the importance of entrepreneurial acumen in determining SME creditworthiness and performance under risk-sharing contracts.

Furthermore, the financial management skills of the entrepreneur were also found to have a significant positive relationship with the IFI's decision to finance SMEs through participatory modes. Financial management competence is essential not only for operational sustainability but also for building financier's confidence in the SME's ability to manage risk, allocate resources efficiently, and maintain financial discipline. One of the recurring issues for owner-managed SMEs especially in developing economies is the inability to separate personal finances from business accounts, which often leads to poor decision-making and financial mismanagement. As Kirsten (2018) observes, improving the financial literacy and management capacity of SME owners is fundamental to increasing the survival and growth prospects of small firms. According to Vohra and Dhillon (2014) the profitability and long-term success of any enterprise is largely contingent upon effective financial management. This view is reinforced by Paarima et al (2021) who defines financial management skill as the ability to implement financial control systems, analyse financial statements, and make informed financial decisions. As Islamic participatory financing relies on accurate profit calculation and transparent reporting, entrepreneurs with such skills represent lower moral hazard risks and thus more favourable clients for IFIs. These findings are further supported by recent empirical works such as Muneem et al (2024), Islam and Ahmad (2020), Zada et al (2019), Khasanah and Irawati (2022), and Folajinmi and Peter (2020) all of whom highlight financial acumen as

a critical factor influencing SME access to Islamic finance, especially under equity-based models. The findings of entrepreneurial skills and financial management capabilities confirms that capability-based factors are central to SME success, even within Islamic finance contexts. The supports the resources-based-view which argues that firm-specific resources particularly intangible ones such as knowledge and competencies drive competitive advantage (Barney, 1991). Again, the positive association of these variables with the IFI financing outcome validates central role information asymmetry in influencing SME access to finance as the results partially signalled the importance of mitigating information asymmetry between SME operators and Islamic Financial Institutions.

Moving on, the willingness of SME entrepreneurs to adopt Islamic participatory modes of financing is also found to have a strong positive relationship with the decision of Islamic Financial Institutions to engage in such financing arrangements. The foundational principle of Islamic participatory finance particularly under *Mudarabah* and *Musharakah* is the equitable sharing of risk and reward between the financier and the entrepreneur. Therefore, an SME operator's expressed willingness to engage in these modes serves as a strong indicator of alignment with the ethos of Islamic finance and suggests a higher degree of compatibility with IFI's ideal financing frameworks. This result contrasts with conventional assumptions grounded in agency theory, particularly those related to information asymmetry and moral hazard, which suggest that SME operators typically prefer non-participatory modes of financing to retain profits while externalising risk. As highlighted in the extant literature, including Nouman and Ullah (2014), Zhou and Wu (2011) and Nouman et al (2018) many entrepreneurs only seek participatory financing when facing uncertain or high-risk projects often when the financial viability or outcomes are difficult to forecast.

However, the positive relationship found in this research may be attributed to two key contextual factors. First, a significant portion of the respondents operate in relatively low-risk sectors such as retail and services, rather than more volatile industries like manufacturing, agri-business, or extractive sectors. Second, religiosity among SME entrepreneurs may also play a critical role in shaping their financing preferences. Religious commitment, particularly within Islamic contexts, has been shown to improve ethical decision-making, reduce opportunistic behaviours, and enhance risk awareness all of which contribute to more stable and trustworthy business conduct. This aligns with the arguments made by Tepe et al (2016) regarding the positive effect of religiosity on moral characteristics and the reduction of idiosyncratic risk. These findings are consistent with previous empirical studies such as Zhou and Wu (2011),

Chen et al (2016), Adhikari and Agrawa (2016), Islam and Ahmad (2020) and Jallow (2023) all of whom emphasise the relevance of ethical values and sectoral context in explaining SME's openness to participatory financing models. Findings suggest that SME behaviour is not solely driven by profit maximisation, as assumed in neoclassical theory.

Furthermore, the results indicate that the knowledge level of SME entrepreneurs regarding Islamic finance principles and products exhibits a strong negative relationship with the dependent variable. This finding is particularly intriguing given that lack of knowledge and awareness is frequently cited in the literature as a primary obstacle to the adoption of Islamic participatory modes of financing (Islam and Ahmad, 2020; Pala et al, 2024). Islamic participatory financing models, such as *Mudarabah* and *Musharakah*, are inherently trust-based arrangements, wherein the financier assumes a degree of risk not typically present in conventional debt contracts. These models limit the financier's recourse in cases of opportunistic behaviour by the entrepreneur, particularly due to the absence of guaranteed returns and, in some cases (e.g., *Mudarabah*), restrictions on the financier's involvement in business operations.

The negative association between knowledge level and IFI's decision to use participatory modes as observed in this study, may reflect concerns from financiers that increased awareness among SME operators could expose the structural limitations of these financing models namely, the non-guarantee of capital and profit, and limited legal safeguards for the financier. As entrepreneurs become more knowledgeable about the rights and restrictions embedded within Islamic participatory contracts, IFIs may perceive a heightened risk of moral hazard or strategic manipulation, particularly in weak legal or regulatory environments. While many previous studies have found a positive relationship between entrepreneur's knowledge and their willingness to engage with participatory modes (e.g., Islam and Ahmad, 2020) the present findings suggest a counter-narrative one, where knowledge may, paradoxically, reduce the perceived attractiveness of these instruments from the financier's perspective. This finding is supported by Rasheed and Siddiqui (2022), Othman et al (2023) and Rasheed et al (2018) who highlight that in certain contexts, increased awareness of Islamic financial contracts can expose vulnerabilities in their enforcement and execution, thereby lowering institutional confidence in their application.

Moving forward, the results reveal that the financial ratio variable comprising solvency, operating leverage, and financial leverage ratios, exhibits the strongest positive relationship with the dependent variable. These financial ratios serve as critical indicators of a firm's

financial health, operational efficiency, and risk profile, and are thus instrumental in influencing the decision of the Islamic Financial Institutions to adopt participatory modes of financing. As previously discussed, each of these ratios individually demonstrated a positive association with firm performance (Habibi and Iqbal, 2021 ; Grau and Reig, 2021; Iqbal and Usman, 2018). Therefore, it is unsurprising that collectively, these ratios when conceptualised as a single composite financial health indicator is significantly and positively associated with the decision to engage in Islamic participatory finance, which is fundamentally structured around performance-driven returns. In the context of Islamic finance, this result becomes quite intriguing. Although Islamic financial institutions are theoretically guided by a distinct logic grounded in ethical and social objectives, they often operate within a wider financial system dominated by conventional market which prioritises efficiency, risk minimisation, and profit maximisation, often resulting in the preferential allocation of financial resources to larger and more established firms (Friedland and Alford, 1991; Beck and Demirgüç-Kunt, 2006). This creates tensions that may limit the adoption of participatory, risk-sharing modes of financing. This finding aligns with previous studies such as Muneem et al (2024) and Kulmie and Omar (2024) who emphasised that financial soundness and efficiency indicators are among the primary factors considered by IFIs when evaluating SME financing proposals under participatory arrangements.

Since Islamic participatory modes involve risk and profit-sharing, IFIs are naturally inclined to favour SMEs that demonstrate strong financial fundamentals, as this reduces the risk of capital erosion and enhances the prospects of return on investment. In addition, results from Model 5 indicate that the composite variable representing SME entrepreneur's socio-demographic characteristics and firm-level attributes also has a significant positive relationship with the dependent variable. This variable aggregates the non-financial determinants such as firm age, ownership status, respondent's age, years of business experience, educational level and gender, all of which have been previously identified as important predictors of firm performance (Mgeni and Nayak, 2016; Tanui and Serebemuom, 2021; Essel et al, 2019; Vasan, 2020). Given the inherent relationship between firm performance and the profit-oriented nature of Islamic participatory financing, it is logical to observe a positive and significant association between these socio-demographic and firm-level features and the decision of IFIs to deploy Islamic participatory modes. This result is consistent with findings from Shaban et al (2014) who reported that firm profitability and other performance-related factors significantly influence the willingness of Islamic banks to invest in SMEs.

Like Model 5, which utilises factor scores for the regression analysis, the results from Model 6 which uses the mean scores also exhibit a comparable pattern of relationships between the independent variables and the dependent variable. While the overall structure and direction of the relationships remain consistent across both models, Model 5 (factor scores) demonstrates a slightly superior explanatory power for most of the variables, except for the financial ratio variable, which performs marginally better in Model 6. As such, the discussions, interpretations, and theoretical justifications previously provided for Model 5 are equally applicable to Model 6. This consistency across models further reinforces the robustness of the relationships identified in this study. However, the comparative analysis between the two models suggests that the use of factor scores provides a more refined and accurate representation of the underlying latent constructs than the mean score approach. Factor scores capture the weighted contribution of each item to its respective construct, thereby offering a more nuanced and statistically rigorous input for regression modelling. Accordingly, these results suggest that the factor score technique is a more appropriate and effective method for psychometric analysis using multiple regression in the context of this research. This finding also aligns with the methodological arguments in psychometric literature, which emphasise the superiority of factor scores in representing latent constructs in multivariate statistical analyses.

### **9.3 Discussion on Decision Tree Analysis**

The decision tree approach is a widely used technique in data mining and has proven to be a powerful and effective statistical method for addressing classification and prediction problems. Its popularity is attributed to several key advantages, including its ease of interpretation, intuitive visualisation of outcomes, and its capability to handle missing values and various types of data (categorical and numerical alike). In the preceding sections of this study, the scoring techniques applied to the research participants specifically the SME applicants were discussed in detail, incorporating both mean scores and factor scores. Furthermore, a range of classification algorithms were implemented using the WEKA software, based on these derived scores to assess the predictive performance and classification accuracy of the models.

Classification, as a supervised learning technique, involves learning from a labelled dataset to predict the class of new or unseen data. In this research, the dataset was divided into two balanced classes suitable and unsuitable based on the rearrangement of both the mean and factor scores derived from the variables. This approach was adopted to ensure that the classification model had sufficient representation in each class for effective learning. To identify the most suitable classification method for the research data, four different

classification algorithms were applied. The objective was to classify SME participants based on their scores from a psychometric assessment into either the suitable or unsuitable category. Based on the analysis, it was found that scoring participants using mean scores yielded the highest classification accuracy compared to factor scores. This was confirmed using the K-fold cross-validation test option. Among the algorithms tested, the CHAID algorithm implemented in the WEKA data mining suite as J48 demonstrated the highest overall classification accuracy, as well as superior performance based on the confusion matrix metrics. This suggests that, for the purposes of this research, mean scoring combined with the J48 decision tree classifier offers the most robust model for accurately categorising SME participants based on their psychometric profiles.

The overall classification accuracy of the model is 78 per cent, which is significantly higher than the baseline accuracy of 50 per cent derived from the binary nature of the research dataset. Specifically, the model correctly classified over 73 per cent of SME entrepreneurs in the 'suitable' category and over 84 per cent in the 'unsuitable' category, resulting in a balanced average accuracy rate of 78 per cent across both classes. Furthermore, a core advantage of the decision tree technique particularly in the context of classification and prediction is its ability to generate explicit decision rules that are useful in interpretability and decision-making. This feature enhances the practical applicability of the model by providing clear, actionable insights for decision-makers. From the application of the CHAID algorithm and using the mean scores, a series of decision rules have been extracted, which can serve as a valuable guide for the Islamic Financial Institutions in assessing the suitability of SME applicants for participatory financing modes.

**Table 9.0 Comparison of Decision Trees Based on Mean Scores and Factor Score**

<b>Feature</b>	<b>Mean Score-Based Model</b>	<b>Factor Score-Based Model</b>
Scoring Technique	Traditional mean of item responses	Thurston regression factor scores (latent variables)
Best Performing Algorithm	CHAID (J48)	CHAID (J48)
Cross-Validation Accuracy	78%	72%
Precision (Wght Avg)	79%	72%
Recall (Wght Avg)	79%	72%
F-Measure (Wght Avg)	79%	72%
Correctly Classified Instances	238 / 304	219 / 304
Tree Size	12 nodes / 7 leaves	9 nodes / 5 leaves
Time to Build Model	0.02 sec	0.00 sec
Rules Generated	6 rules (more complex)	5 rules (simpler)
Interpretability	High clearer thresholds	Moderate factor scores are abstract
Rule Variables	FMS, FR, NFR	FMS, FR
Classification Accuracy for Suitable SMEs	73%	78%
Classification Accuracy for Unsuitable SMEs	84%	66%

From the above comparison table, the mean score-based model demonstrated superior classification accuracy, particularly in distinguishing between suitable and unsuitable SME applicants, with a high precision and recall balance. This makes it better suited for operational decision-making by Islamic Financial Institutions, especially when models need to be interpretable and defensible in real-world financial assessments. In contrast, the factor score-based model, while theoretically grounded in latent trait estimation, produced a simpler decision tree with slightly lower accuracy. Its use may be more applicable in exploratory or confirmatory research settings, or when dimensionality reduction is a priority. The decision rules from the mean score model also incorporated non-financial ratios (NFR), which enhanced its discriminatory power. The inclusion of both financial and non-financial indicators suggests

that a holistic assessment of SMEs considering both quantitative metrics and qualitative features is optimal for Islamic participatory financing decisions.

#### **9.4 Analysis of Hypothesis Testing**

The empirical results of this study provide nuanced insights into the behavioural and competency-based predictors of Islamic participatory financing decisions by IFIs, particularly in the context of SMEs. The hypothesis testing results is conducted based on the regression results from the data analysis, in line with the conceptual framework and research objectives of the study. The analysis evaluates the significance and direction of the relationships between the independent variables assessed through multiple regression techniques and the dependent variable. By integrating psychometrics and data mining techniques, this research represents a methodological innovation in understanding creditworthiness beyond traditional financial metrics.

**Table 9.1 Research Hypotheses based on Factor Scores**

No	Description	$\beta$	p	Decision
H1 <sub>0</sub>	The trustworthiness of the SME entrepreneur does not have a strong and positive relationship with firm performance.	<b>-0.01</b>	<b>0.82</b>	Accepted
H1 <sub>1</sub>	The trustworthiness of the SME entrepreneur does have a strong and positive with firm performance.			Rejected
H2 <sub>0</sub>	The financial management skills of the SME entrepreneur do not have a strong and positive relationship with the IFIs decision to use the Islamic participatory modes.	<b>0.24</b>	<b>0.001</b>	Rejected
H2 <sub>1</sub>	The financial management skills of the SME entrepreneurs do have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes.			Accepted
H3 <sub>0</sub>	The entrepreneurship skills of the SME entrepreneurs do not have a strong and positive relationship with the IFIs decision to use the Islamic participatory modes.	<b>0.2</b>	<b>0.001</b>	Rejected
H3 <sub>1</sub>	The entrepreneurship skills of the SME entrepreneurs do have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes			Accepted
H4 <sub>0</sub>	The knowledge level of SME entrepreneurs on the Islamic finance principles and products does not have strong and positive relationship with the IFI's decision to use the Islamic participatory modes.	<b>-0.09</b>	<b>0.05</b>	Rejected
H4 <sub>1</sub>	The knowledge level of the SME entrepreneurs on the Islamic finance principles and products do have strong and positive relationship with the IFI's decision to use the Islamic participatory modes.			Accepted
H5 <sub>0</sub>	The willingness of SME operators to use to the Islamic participatory modes of financing does not have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes	<b>0.14</b>	<b>0</b>	Rejected
H15 <sub>1</sub>	The willingness if the SME operators to use the Islamic participatory modes of financing do have a strong and positive relationship with the IFI's decision to use the Islamic participatory modes.			Accepted

### ***H1<sub>0</sub> & H<sub>1</sub> Trustworthiness of SME Entrepreneurs and Firm Performance***

Results from Tables 7.10 using model 2, indicate that SME operator's trustworthiness does not significantly affect SME firm performance. Meanwhile in the entrepreneurship literature, trust is highlighted as a predictor for long-term relational success, customer loyalty etc (Watson, 2007). Thus, the absence of a significant relationship in this study suggests that other variables have a stronger direct impact on firm performance than trust alone. For instance, Salleh and Sidek (2011) argue that trust may strengthen stakeholder relationships, but it rarely leads directly to measurable financial outcomes if more fundamental constraints exist. Moreover, in developing economies, firm performance is often shaped by factors such as capital access, ability to manage cash flows, competitive strategies, and adoption of technology, overshadowing personal attributes like trustworthiness (Abor and Quartey, 2010). This is in line with Watson (2007) who found weak links between relational trust and SME profitability.

### ***H2<sub>0</sub> & H2<sub>1</sub> Financial Management Skills and IFI's Decision***

Islamic participatory modes as equity-based financing arrangements, are inherently dependent on business performance for investment returns. The absence of guaranteed interest implies that poor financial planning or mismanagement directly threatens the financial institution's share of profits, or worse, leads to loss of capital. Results from Tables 7.17 and 7.19 using models 5 and 6 indicate that, the financial management skills of the SME entrepreneur have a statistically significant relationship with IFI's decision. This finding resonates with studies such as Adebisi et al (2017) and Folajinmi and Peter (2020), who argue that financial literacy and the application of sound financial practices are strong predictors of SME sustainability and profitability. It also reflects the core principle in Islamic finance that investments should be made in ethically viable and economically sound ventures making financial management skills not just an operational concern, but a Shariah-aligned precondition for partnership. It suggests that IFIs could enhance the use of participatory financing by integrating financial literacy assessments as part of their due diligence process either independently or through automated tools such as the decision tree classification method used in this study.

### ***H3<sub>0</sub> & H3<sub>1</sub> Entrepreneurship Skills and IFI's Decision***

Results from Tables 7.17 and 7.19 using models 5 and 6 indicate that, the entrepreneurial skills of the SME entrepreneurs have a statistically significant relationship with IFI's decision. This finding is theoretically grounded in the principles of risk-sharing in Islamic finance, where the financier is not just a lender but be a partner in the venture. Instruments like the participatory

modes demand a careful appraisal of the entrepreneur's capabilities, since success is shared and failure is jointly borne in the case of *Musharakah*, and completely by the financier in the case of *Mudarabah*. This result aligns with (Frese and Gielnik, 2014) and (Ahmad et al, 2018) findings that entrepreneurial competence is crucial in determining business outcomes, and by extension, financial viability. From a practical perspective, this validates the argument that soft data, derived through psychometrics, can provide predictive power in assessing future business performance especially in so-called 'thin file' environments where SMEs lack robust credit histories.

#### ***H4<sub>0</sub> & H4<sub>1</sub> Knowledge Level and IFI's Decision***

Results from Tables 7.17 and 7.19 using models 5 and 6 indicate that, the knowledge level of the SME entrepreneur on the Islamic finance principles and products have a statistically significant negative relationship with the IFIs decision. This outcome is both surprising and revealing. While knowledge is often a precursor to adoption in the diffusion of innovation theory and previous such as studies Mariadas and Murthy (2017) and Ezeh and Nkamnebe (2021), this result suggests that knowledge alone is not sufficient to drive financing outcomes. It may be case that, knowledge does not always translate into competent application, and there might be a disconnect between theoretical knowledge and practical readiness to engage in Islamic participatory arrangements. This finding highlights the distinction between cognitive understanding and behavioural competence, echoing critiques in both Islamic finance and entrepreneurship literature that awareness campaigns alone are insufficient to foster adoption or secure funding. Hence, the result suggests that while awareness and understanding of Islamic finance are important for adoption, they may not independently drive the financing decisions by IFIs in the absence of more tangible skills and behavioural indicators.

#### ***H5<sub>0</sub> & H5<sub>1</sub> SME Operator's Willingness and IFI's Decision***

Results from Table 7.17 using models 5 indicate that, the willingness of the SME entrepreneurs to adopt the Islamic participatory modes of financing has statistically significant relationship with the IFI's decision. The result underscores that psychological factors especially intention and openness to collaboration are influential in IFI's financing decisions. This result echoes Seddiq et al (2024) and Al Balushi et al (2019) who argue that behavioural intentions (rooted in the Theory of Planned Behaviour) are vital in understanding SME attitudes toward Islamic financial products. Willingness may also reflect the entrepreneur's risk tolerance, ethical alignment, and openness to advisory or governance arrangements, all of which are critical in

participatory finance. Willingness, while intangible, can be quantified through psychometric indicators like trust, openness, and locus of control. Thus, IFIs should not only screen for capacity but also for attitudinal alignment with the core tenets of risk-sharing and partnership.

## 9.5 Comparison of the Empirical Results

In this research, we sought to distinguish between SMEs and identify those that suitable for Islamic participatory modes of financing to support the IFI's in their financing decisions. We first began by estimating the relationships between the identified variables and the IFI's decision-making and finished by classifying SMEs into suitable and unsuitable based on their performances on the identified variables. Results from both analyses are presented below.

**Table 9.2 Performance of the Research Variables across Empirical Models**

Variable	$\beta$		Regression Results		Decision T Results	
	<i>F</i>	<i>M</i>	<i>F</i>	<i>M</i>	<i>F</i>	<i>M</i>
Entrepreneurial skills	0.20	0.08	.001**	.02**	-	-
Financial management skills	0.24	0.15	.001**	.001**	1	1
Willingness of SMEs	0.14	0.01	.00**	0.72	-	-
Knowledge level	-0.09	-0.19	.005**	.001**	-	-
Financial ratios	0.53	0.73	.001**	.001**	2	2
Non-financial ratios	0.16	0.15	.001**	.001**	-	3

*note*  $\beta$  (coefficient) *F* (Factor score) *M* (Mean score) 1(Best), 2 (second best), 3 (third best).

A total of six predictor variables has been used in the empirical analyses comprising the four main psychometric variables and two composite variables created from items in model 1 on firm performance. Except for SME operator's willingness, all the other variables maintained a consistent and significant relationship under both factor and mean scores. However, not all the variables with significant relationship in the regressions results, were used in the decision tree building. The non-selection of certain statistically significant variables in the decision-tree model is theoretically and methodologically justified. From a theoretical standpoint, the divergence between regression and decision-tree results reflects the underlying conceptual difference between *explanatory modelling* and *predictive modelling*. Regression is optimised for inference i.e., identifying whether relationships exist and whereas decision trees are optimised for classification accuracy and model parsimony (Shmueli, 2010).

In linear regression, the inclusion and interpretation of variables are based on (*global statistical significance*), which examines whether a predictor has a non-zero association with the outcome across the entire dataset while controlling for other variables (Wooldridge, 2016). However,

decision trees operate on a fundamentally different principle, they identify predictors based on their ability to create (*locally optimal splits*) that maximise impurity reduction, information gain, or Gini improvement at specific nodes (Breiman et al, 1984). Because of these methodological distinctions, it is common for variables that are statistically significant in regression to be excluded by the decision-tree algorithm if they do not improve the splitting criterion relative to competing predictors. Thus, the exclusion of variables such as entrepreneurial skills, willingness of SMEs, and knowledge level from the decision-tree model can be understood within this framework.

Furthermore, the contribution of predictor variables on the outcome in regression is incremental rather than dominant. For instance, regression can retain multiple correlated predictors simultaneously because each is evaluated by its partial contribution, even where conceptual or statistical overlap exists (Aiken and West, 1991). In contrast, decision trees are specifically designed to eliminate redundant or weakly competitive variables. For instance, when two or more predictors share explanatory variance, the tree algorithm typically selects only the variable that provides the highest impurity reduction in the first split and disregards the rest, regardless of their p-values in regression (James, Witten, Hastie and Tibshirani, 2013). Thus, the exclusion of the other variables in the decision does not imply irrelevance, rather, it reflects their relatively weaker discriminatory power compared with more dominant predictors. This is again reflective of the fact that decision trees inherently prioritise predictive performance and interpretability over statistical significance. In summary, the non-selection of certain statistically significant variables in the decision-tree model is theoretically and methodologically justified. It arises from the tree algorithm's preference for variables with the highest discriminatory power, its automatic elimination of redundant predictors, and its alignment with predictive rather than inferential modelling objectives. This outcome is well supported in the methodological literature and reflects the expected behaviour of decision-tree models in applied social-science and financial-behaviour research. The overriding implication of the empirical findings for Islamic finance especially the decision tree results indicate that, Islamic finance values like ethics, willingness, religiosity, risk-sharing etc matter at conceptual level, but financial viability dominates operational financing decisions.

## **9.6 Conclusion**

This chapter provided a comprehensive discussion and interpretation of the empirical findings derived from multiple regressions and decision tree analyses, which collectively addressed the main aim of this study, which is to explore the potential value of psychometrics and data mining

as innovative screening mechanisms to promote the use of Islamic participatory modes of financing for SMEs by IFIs. From the findings of the research, the socio-demographic profile of the respondent's i.e., male-dominance, predominantly middle-aged, relatively educated, and highly experienced, paints a picture of an SME sector that is deeply embedded in the socio-economic fabric of The Gambia. These characteristics not only influence the nature of SME operations but also have implications for their financial behaviour, risk appetite, and willingness to engage with alternative financing models such as the Islamic participatory instruments.

The firm-level characteristics of SMEs indicate a micro-enterprise landscape that is concentrated in trade-based activities and are geographically clustered around urban centres. This underscores the need for tailored financial instruments particularly Islamic participatory modes that are responsive to the structural and developmental needs of SMEs in The Gambia and similar countries. On the results of firm performance analysis, results suggest that although conventional financial and entrepreneurial competencies remain critical for firm performance measurement, however, psychometric and behavioural attributes exert more complex and contextually nuanced effects. This highlights the need for IFIs in their assessment of SMEs for suitability for the Islamic participatory financing modes, that their due diligence must go beyond the standard traditional filters and to incorporate nuanced assessments of financial behaviour, knowledge, skills, moral fortitude and context-driven limitations for a better-informed financing decision.

Furthermore, the results of the moral hazard problem proxied by trust level of the SME operator, support the inclusion of psychometric evaluations in Islamic finance risk assessments and align with the ethical foundations of Islamic economic jurisprudence. The findings on the decision of the IFIs to use the Islamic participatory modes confirms the main hypothesis of this research which is, the psychometric attributes of the SME entrepreneurs combined with financial indicators and firm characteristics, significantly inform the decision-making of Islamic Financial Institutions regarding the use of Islamic participatory financing. The use of decision tree analysis further strengthened the empirical narrative by offering practical, rule-based classification mechanisms to distinguish between suitable and unsuitable SME applicants. The CHAID algorithm, applied to mean score data, produced the highest classification accuracy 78 per cent, thereby validating the psychometric approach as a viable preliminary screening tool. The derived decision rules based primarily on financial management skills, financial ratios, and non-financial ratios offer actionable insights for IFIs and demonstrate the potential of integrating data mining techniques into Islamic finance

operations. These rules, however, are not deterministic and should be complementary rather than replacement for the traditional due diligence processes.

Taken together, the results from both statistical modelling and machine learning underscore a critical insight, which suggests that psychometric factors, when combined with financial indicators, can offer robust predictive power in assessing SME suitability for Islamic participatory financing. Furthermore, the findings illustrate that IFIs would benefit from incorporating structured psychometric evaluations and algorithmic decision tools into their risk assessment frameworks particularly as they seek to extend financing to a broader SME base without compromising the principles of Shariah compliance or financial prudence.

## CHAPTER 10

### CONCLUSION AND RECOMMENDATIONS

#### 10.0 Introduction

As the concluding chapter of the dissertation, it summarises the key findings of the empirical examinations and the overall conclusion that is drawn from the results of the study. It highlights the implications of the results of the study and outlined the limitations of the study. The chapter ends with some practical recommendations for both IFIs as practitioners and regulators as key stakeholders as well as suggest the direction for further studies.

#### 10.1 Summary of Key Empirical Findings

This study set out to investigate the factors that influence IFI's decisions to deploy the Islamic participatory modes of financing. Using two complementary inferential techniques including multiple regression analysis and decision-tree modelling, the research provided a multidimensional understanding of how entrepreneurial competencies, behavioural attributes, and financial indicators jointly shape the outcome of the IFI's decision to deploy participatory financing for SMEs. The findings from both analytical approaches converge on several central insights, while also illuminating important methodological distinctions that enhance the overall robustness of the study's empirical conclusions.

The regression analyses, conducted using both factor scores and mean scores, served as the primary mechanism for testing the research hypotheses. These models demonstrated that most of the theorised constructs significantly influence IFI's financing decision for SMEs. Entrepreneurship skills, financial management skills, willingness to adopt Islamic participatory modes, and knowledge level on Islamic finance principles and products all exhibited statistically significant positive relationships with the IFI's financing decision as the dependent variable. These findings confirm that SME operator's competencies and attitudinal readiness play an important role in shaping IFIs' decisions, consistent with prior research emphasising the importance of managerial capacity, financial literacy, and behavioural alignment in their assessment for access to finance. Financial ratios and non-financial ratios emerged as strong predictors within the regression models, reinforcing the critical role of organisational financial health in influencing financing decisions and overall firm performance. However, SME operator's trustworthiness, the only variable that failed to achieve significance, showed no

measurable effect on performance in this study, suggesting that, within this empirical context, interpersonal trust alone does not drive financing or performance outcomes as strongly as more tangible managerial and financial capabilities.

While the regression models established the statistical relevance of a wide range of predictors, the decision-tree model helped clarify which among these variables are most decisive when predicting IFI's financing decisions. Unlike regression, which assesses average marginal effects while controlling for other variables, the decision-tree algorithm prioritises variables that create the clearest and most discriminative classifications. Accordingly, only three variables such as financial management skills, financial ratios, and non-financial ratios, were retained as decision rules in the decision tree structure. Their emergence as the dominant splitting variables indicates that they exert the strongest and most immediate influence on classification accuracy. By contrast, variables such as entrepreneurial skills, willingness, and knowledge level, although statistically significant in regression, but they did not demonstrate sufficient discriminatory power to be selected by the decision tree techniques. This reflects the algorithm's tendency to favour predictors with sharper quantitative thresholds and stronger predictive consistency.

In sum, the two analytical approaches offer a coherent picture of the determinants of SME financing outcomes for participatory modes by IFIs. The regression results confirm that a broad range of entrepreneurial competencies and behavioural dispositions significantly influence SME performance and IFI's decision for participatory financing modes. The decision-tree results refine this understanding by identifying the core variables that exert the strongest and most decisive influence when constructing actionable decision rules. The consistency across both models regarding the centrality of financial management skills and financial ratios strengthens the reliability of these findings and highlights the dominance of financial capability and quantitative indicators in IFIs' financing assessments. At the same time, the divergence observed particularly the omission of several significant behavioural variables in the decision tree illustrates the difference between explanatory relevance and predictive dominance, reinforcing the value of using mixed inferential techniques to obtain a more nuanced empirical picture.

Overall, the combined findings underscore that while SMEs' behavioural dispositions and knowledge levels contribute meaningfully to understanding financing dynamics, the financial robustness of the firm and the financial literacy of the entrepreneur remain the most critical determinants influencing IFIs' decision-making processes. The study therefore contributes to

existing scholarship by demonstrating that a dual-method inferential approach can provide richer and more reliable insights than reliance on regression alone, and it highlights the continued importance of strengthening SME financial capabilities to improve access to Islamic participatory financing. From the analyses of the empirical findings from both regression and data mining classification technique. The overriding conclusion that is drawn from results indicate that the integration of psychometric testing and data-driven risk assessment tools, while innovative, risks reinforcing a neo-liberal orientation within Islamic finance where efficiency, risk pricing, and profitability dominate rather than promoting the foundational Islamic principles of risk-sharing, social justice, and equitable wealth distribution. Thus, an alternative ecosystem that aligns with Islamic institutional logic would be needed to shift the focus from screening out risk to sharing and managing risk collectively thereby supporting inclusion rather than exclusion for SMEs and the broader client of the Islamic financial institutions.

## **10.2 Implications of the Research Results**

The results of the empirical examinations in this research have some profound implications for the Islamic finance industry and especially for key stakeholders like the practitioners and regulators in The Gambia, considering the state of the Islamic finance ecosystem in the country. The findings suggest that while Islamic participatory financing remains theoretically aligned with the principles of risk-sharing and ethical partnership, its practical application is constrained by institutional weaknesses, information asymmetry, and risk-averse financial behaviour, resulting in a system that prioritises financial capability over moral trust and thereby limits the transformative potential of Islamic finance. Meanwhile, few of the implications of these findings are highlighted below taking into consideration the state of affairs for Islamic finance in The Gambia:

- i. ***Empirical Validation of Integrating Psychometric and Data Mining in SME Financing Decision-Making:*** The findings of the research provide empirical support for the integration of psychometric testing and data mining techniques into SME financing decision-making frameworks, particularly within the context of Islamic participatory modes. The results demonstrate that, combining behavioural indicators with quantitative modelling, can enhance the evaluation of SME applicants, offering a more nuanced and multi-dimensional assessment approach, compared to reliance on traditional financial metrics alone. This stands to offer a measurable advantage in identifying viable SME clients more accurately than using traditional methods only. For IFIs in The Gambia, the key implication is not to

simply adopt the new tools as substitutes, but rather strategically integrate them into a broader, context-aware decision-making system. When properly implemented, this approach can reduce information asymmetry, improve risk profiling, and ultimately support the expansion of Islamic participatory financing in a way that is both analytically robust and aligned with the structural realities of the SME sector especially in developing countries like The Gambia where informality is predominant.

- ii. ***Justifying and Encouraging Hybrid Scoring:*** The comparable findings of this study especially the stronger classification performance of mean-based scoring models alongside the conceptual robustness of factor-based approaches in capturing latent psychological constructs, provide a compelling case for the adoption of hybrid scoring frameworks. While mean-based scores offer simplicity, transparency, and operational efficiency (as evidenced by higher classification accuracy in the decision tree analysis), factor scores provide a more theoretically grounded representation of underlying behavioural and psychometric dimensions such as trust, entrepreneurial orientation, and financial discipline. Hence, rather than seeing these approaches as substitutes, the results suggest that they are complementary. A hybrid scoring approach would allow Islamic Financial Institutions in The Gambia to balance practical decision-making needs with deeper analytical insight. For instance, mean-based thresholds can be employed for initial screening and rapid classification of SME applicants, particularly in high-volume, resource-constrained environments. Subsequently, factor-based scores can be used for more nuanced evaluation, portfolio segmentation, and strategic decision-making, especially in cases involving higher financing exposure or participatory contracts such as *Mudarabah* and *Musharakah*.

This layered approach aligns with broader practices in psychometrics and data science, where multiple measurement techniques are combined to enhance both predictive performance and construct validity. In the Gambian context which is characterised by informality, limited financial records, and socially embedded economic behaviour, a hybrid model is particularly advantageous, as it captures both observable indicators and deeper behavioural traits that influence SME performance and trustworthiness. The stronger performance of the mean-based models as opposed to the factor-based models and the conceptual clarity of the factor-based scoring technique for the latent variables such as the entrepreneurs psychological factors, suggests that a hybrid scoring technique will offer both operational efficiency and deeper psychological insight. Moreover, this aligns with industry best practices in psychometrics and data science. IFIs in The Gambia could implement this

using mean-based thresholds for quick classification and factor scores for strategic refinements.

iii. ***Strengthening Better Risk Assessment and Management and the Facilitation of Informed***

***Financing Decisions:*** The integration of psychometric testing into traditional SME risk assessment frameworks offers a pathway towards more comprehensive and nuanced evaluation processes. By complementing conventional financial indicators with behavioural and cognitive measures, IFIs in The Gambia can develop a more holistic understanding of SME applicants, by capturing not only financial capacity but also entrepreneurial competence, discipline, and trust-related attributes that are critical in Islamic participatory financing. This enhanced approach is particularly valuable in contexts characterised by limited financial documentation and high levels of informality, where traditional risk assessment tools alone may be insufficient. Psychometric insights help bridge this gap by providing alternative signals of creditworthiness, thereby reducing information asymmetry and improving the overall quality of risk profiling.

Also, the use of empirically derived decision rules such as those generated through decision tree classification, can support more consistent and transparent decision-making. These rules introduce a degree of standardisation into the screening process, helping to reduce arbitrary judgement and certain forms of cognitive bias that may arise in purely subjective assessments. Similarly, the use of tried and tested decision rules will help to eliminate and reduce to a very large extent biases in the SME financing decisions. In The Gambian context, where SME financing decisions are often influenced by relational dynamics and informational constraints, the combined use of psychometric tools and data-driven decision rules can significantly improve the quality, consistency, and credibility of financing decisions. This, in turn, supports the more effective deployment of Islamic participatory financing by aligning risk assessment practices with both the behavioural realities of entrepreneurs and the ethical principles underpinning Islamic finance.

iv. ***Improved Funding and Financial Inclusion for SMEs:***

The integration of psychometric testing and data mining into SME risk assessment frameworks has important implications for improving access to finance and advancing financial inclusion in The Gambia. By strengthening the quality and depth of risk evaluation, these tools enable IFIs to move beyond restrictive, collateral-based lending models and identify creditworthy SMEs that would otherwise remain excluded from formal financing channels. In particular, the enhanced ability to assess entrepreneurial capability, behavioural traits, and financial discipline provides IFIs with greater confidence in extending Islamic participatory

financing modes such as *Mudarabah* and *Musharakah*. This is especially significant in a context like The Gambia where many SMEs lack formal financial records or sufficient collateral but may still possess viable business models and strong managerial potential. As a result, improved risk assessment does not simply reduce uncertainty, but it expands the pool of eligible SME clients by recognising alternative indicators of creditworthiness. This has the potential to unlock financing opportunities for the underserved groups, including SMEs, youth- and women-led enterprises etc., thereby contributing to broader financial inclusion and economic participation.

However, the inclusivity gains from these tools will depend on their equitable and context-sensitive application. If designed and implemented appropriately, they can support a more inclusive financial ecosystem in The Gambia, that balances prudent risk management with the developmental objectives of Islamic finance. This will enable IFIs to scale up participatory financing in a manner that is both financially sustainable and socially impactful.

- v. ***Digital Transformation a Must for IFIs to make a Meaningful Impact:*** The strong performance of the decision tree classifiers in accurately distinguishing between suitable and unsuitable SME applicants, alongside the generation of clear and interpretable decision rules, provides a compelling empirical basis for the digitalisation of credit evaluation processes for IFIs in The Gambia. These findings demonstrate that data-driven tools can enhance both the consistency and efficiency of SME screening, particularly in the context of Islamic participatory financing where evaluation complexity is inherently higher. Digital transformation should therefore be viewed not as an optional enhancement but as a strategic necessity for IFIs seeking to scale their impact. By embedding psychometric assessments, automated scoring systems, and rule-based decision engines into digital platforms, IFIs can streamline application processing, reduce turnaround times, and improve the standardisation of risk assessment practices. This is especially relevant in The Gambia, where manual and relationship-based lending practices still dominate and can limit outreach, transparency, and scalability. Moreover, digitalisation facilitates better data capture, storage, and analysis, enabling continuous model refinement and institutional learning over time. It also supports improved governance through auditability, traceability of decisions, and reduced discretion-based inconsistencies. These benefits align closely with global fintech trends and emerging best practices in financial sector governance, which emphasise data-driven decision-making, transparency, and inclusivity.

- vi. ***Policy Refinement to Accommodate Growing Trends:*** One of the most significant implications of the research findings lies at the policy level, particularly the need for regulatory frameworks to evolve in response to emerging innovations in SME financing. The demonstrated potential of psychometric assessment and data mining techniques highlights a growing shift towards data-driven and behaviourally informed credit evaluation models. However, without an enabling regulatory environment, the adoption and effective implementation of these innovations may remain constrained. Regulators most notably the Central Bank of The Gambia, should therefore take a proactive role in refining existing policies and, where necessary, introduce new legal and regulatory provisions that recognise and support the use of such tools in financial decision-making. This may include establishing clear guidelines on the use of alternative data in credit assessment, ensuring transparency and accountability in algorithmic decision-making, and developing standards for the validation and ethical deployment of psychometric instruments.
- In addition, regulatory frameworks should be adapted to accommodate the unique characteristics of Islamic participatory financing, particularly in relation to risk-sharing contracts, governance structures, and dispute resolution mechanisms. Strengthening legal clarity around these instruments will reduce uncertainty and encourage greater adoption by Islamic Financial Institutions. Importantly, policy refinement should not be limited to supervision and compliance, it should also play a developmental role by fostering innovation, supporting pilot programmes, and facilitating collaboration among stakeholders. In The Gambian context where the financial system is still evolving, regulators must act as ecosystem enablers, ensuring that innovation is both responsibly governed and effectively harnessed to promote financial inclusion and economic development.

### **10.3 Research Limitations**

While the research offers some valuable findings on the potential value of combining psychometric assessment with data mining techniques in SME evaluation, it is not without some limitations. These limitations may be understood from the below themes.

- i. ***Geographic Coverage:*** This research adopts The Gambia as a single-country case study, focusing on a Muslim-majority developing economy with a relatively underdeveloped Islamic finance ecosystem. While this context provides rich, context-specific insights into the interaction between SME behaviour, Islamic finance, and innovative risk assessment tools, it also imposes limitations on the generalisability of the findings. The structural characteristics

of The Gambia, including high levels of informality, limited financial infrastructure, weak legal enforcement mechanisms, and the socially embedded nature of economic activity, play a significant role in shaping both SME behaviour and institutional decision-making. As a result, the observed relationships between psychometric variables, financial indicators, and financing outcomes may be highly context dependent. Consequently, the findings should not be interpreted as universally applicable or as a definitive benchmark for evaluating the effectiveness of psychometric testing and data mining in promoting Islamic participatory financing. In more developed Islamic finance markets, or in economies with stronger institutional frameworks and different socio-cultural dynamics, the relative importance of behavioural, financial, and technological factors may differ significantly. Nevertheless, the value of this study lies in its contribution to contextualised understanding. By situating the analysis within The Gambian political economy and its lived Islamic practices, the research offers insights that are particularly relevant for similarly structured economies, while also highlighting the need for caution in cross-country generalisation. Future studies are therefore encouraged to replicate and extend this research across diverse geographical and institutional settings to enhance external validity and comparative understanding.

- ii. ***Research Respondents and Data Collection Technique:*** A key limitation of this study relates to the nature of the respondent sample and the data collection approach. Due to the limited adoption of Islamic participatory financing modes in The Gambia, many SME respondents included in this research were not actual users of instruments such as *Mudarabah* or *Musharakah*. Instead, their responses largely reflect stated preferences or expressed willingness to engage with such financing arrangements rather than observed behaviour based on real participation. This introduces the possibility of hypothetical or aspirational bias, where respondents may overstate their willingness to adopt Islamic participatory financing. In the Gambian context, where Islam plays a significant role in shaping social norms and individual identity, such responses may be influenced by a desire to align with religious expectations rather than purely economic considerations. As a result, the measured willingness to adopt participatory modes may not fully translate into actual financing behaviour under real market conditions.

Furthermore, the data for the psychometric variables utilised in this study were collected through self-reported survey instruments. While this is a widely accepted approach in behavioural and psychometric research, it is inherently susceptible to response bias, including social desirability bias, acquiescence bias, and subjective misreporting. This concern is particularly salient in culturally sensitive and morally framed domains such as Islamic finance,

where respondents may consciously or unconsciously present themselves in a more favourable ethical or behavioural light. Taken together, these factors suggest that the findings should be interpreted with caution. While the results provide valuable insights into behavioural tendencies and perceived preferences, they may not fully capture actual decision-making dynamics in practice. Future research could address these limitations by incorporating longitudinal data, behavioural experiments, or administrative financing records to validate stated preferences against observed outcomes, thereby strengthening the robustness and external validity of the findings.

- iii. ***Variable Measurement and Scoring Techniques:*** Another limitation of this study relates to the measurement and operationalisation of key variables, particularly the dependent variable representing the decision of Islamic Financial Institutions to utilise participatory financing modes. In this research, the dependent variable was not directly observed but was instead constructed as an index derived from firm performance (an observed variable) and SME operator trustworthiness (a latent construct). While this approach is methodologically defensible and consistent with psychometric principles particularly the conjunctive measurement framework proposed by Schneider (1959), it remains an indirect proxy for actual institutional decision-making. As such, the constructed variable may not fully capture the complexity, discretion, and contextual judgement inherent in real-world financing decisions made by IFIs. Direct measurement such as using actual financing decisions or institutional records, would likely provide a more precise and externally valid representation of this outcome. Therefore, the findings should be interpreted with an understanding of this abstraction and its potential implications for inference.

In addition, the study relies primarily on mean scores and factor scores for the construction and analysis of psychometric variables. While these are well-established and widely accepted techniques in both psychometrics and applied research, they are not exhaustive. Alternative scoring methods such as raw scores, standardised scores, or z-scores etc., may yield different distributions, sensitivities, and analytical outcomes, particularly when applied to different datasets or research contexts. This suggests that the robustness of the findings may, to some extent, be contingent on the chosen scoring methodology. Future research could therefore benefit from experimenting with alternative measurement and scaling techniques, as well as validating results across different scoring frameworks. Such efforts would enhance the methodological robustness and comparability of findings in the evolving field of psychometric-based SME financing assessment.

iv. ***Data Analysis Approach:*** A further limitation of this study relates to the data analysis approach, particularly the reliance on specific classification algorithms and modelling choices. Although multiple classification techniques were explored, the results remain inherently algorithm dependent. The performance and outcomes of decision tree models including the CHAID-based classifier (implemented as J48), are sensitive to data structure, parameter specifications, and model configuration. As such, the superiority of the selected model in this study does not preclude the possibility that alternative machine learning approaches such as ensemble methods (e.g., random forests, boosting algorithms) or more advanced non-linear models, that could yield improved predictive accuracy or capture more complex relationships within the data. While decision trees are widely valued for their interpretability and ability to generate transparent decision rules, an important consideration in financial decision-making is that they are also susceptible to overfitting, particularly when applied to datasets that are relatively small, noisy, or high-dimensional, as is often the case with psychometric variables. Although this study employed K-fold cross-validation to enhance model robustness and reduce overfitting risk, this technique does not entirely eliminate the possibility of model instability or reduced generalisability to unseen data.

Furthermore, the trade-off between interpretability and predictive power remains a key methodological consideration. While more complex models may offer higher accuracy, they often lack the transparency required for practical implementation in credit risk environments, especially within Islamic finance contexts where accountability and explainability are critical. Therefore, the findings should be interpreted with an appreciation of these methodological constraints. Future research is encouraged to explore a broader range of modelling techniques, conduct comparative performance analyses across algorithms, and test model stability using larger and more diverse datasets. Such efforts would contribute to strengthening the robustness, scalability, and practical applicability of data-driven SME financing models.

v. ***Interpretation and Practical Application of Findings:*** A further limitation of this study concerns the interpretation and practical application of the decision rules generated from the classification models. While these rules are statistically derived and empirically grounded, they are not prescriptive in a legal, regulatory, or operational sense. Rather, they should be understood as decision-support tools that complement rather than replace professional judgement, due diligence, and institutional risk management practices. This is particularly important within the context of Islamic participatory financing modes such as *Mudarabah* and *Musharakah*, where financing decisions involve not only financial considerations but also ethical, religious, and relational dimensions. The inherent complexity of these contracts

requires IFIs to exercise discretion, contextual awareness, and ongoing monitoring beyond what any model can fully capture. Moreover, the decision rules developed in this study are context-specific, reflecting the structural, socio-economic, and behavioural characteristics of SMEs in The Gambia. As such, their predictive validity may not be stable across different institutional environments, time periods, or datasets. Changes in market conditions, regulatory frameworks, or entrepreneurial behaviour could reduce their applicability if not regularly updated and validated.

In addition, the classification framework employed in this research categorising SMEs into binary groups (i.e., suitable or unsuitable), may oversimplify the inherently continuous and multidimensional nature of creditworthiness. In practice, SME risk profiles exist along a spectrum, and financing decisions often involve gradations of risk tolerance, pricing adjustments, and conditional approvals rather than absolute inclusion or exclusion. Therefore, while the findings provide valuable insights and practical guidance, their application should be approached with caution and flexibility. Future research and institutional practice should consider more granular classification frameworks, probabilistic risk scoring, and continuous monitoring systems to better reflect the complexity of SME financing decisions in real-world settings.

## **10.4 Recommendations**

The findings of the research have provided strong insights for integrating psychometric testing and data mining in the assessment of SMEs in the use of Islamic participatory modes of financing in The Gambia. The findings of this study extend beyond firm-level analysis and reveal deeper structural dynamics shaping SME behaviour in The Gambia. Specifically, the results highlight the interaction between institutional constraints, informality, religious norms, and financial system limitations, all of which influence both firm performance and access to Islamic participatory financing. As such, policy recommendations must move beyond technical financial solutions and instead address the broader political economy context within which SMEs operate. For Islamic participatory financing to become a viable instrument for SME development in The Gambia, policy must move beyond promoting Islamic finance as a standalone solution. Instead, a systemic approach is required, one that strengthens financial infrastructure, integrates informal economic practices, enhances institutional capacity, and aligns Islamic financial principles with the lived realities of SME entrepreneurs. Only through such structural alignment can participatory finance fulfil its dual promise of economic efficiency and ethical inclusivity within the Gambian context. The recommendations are there

made cognizant of these broader realities in The Gambia. Hence, the below recommendations are made to IFIs and the policy makers in The Gambia for consideration.

**For Islamic Finance Institutions:**

- i. ***Build Internal Capacity:*** Given that psychometric testing and data mining-based classification are relatively recent innovations in credit risk assessment, particularly within underdeveloped Islamic finance ecosystems such as The Gambia, their effective adoption depends fundamentally on institutional capacity. Without the requisite technical understanding and operational readiness, these tools risk being underutilised or misapplied. Islamic Financial Institutions in The Gambia should therefore prioritise targeted capacity building for credit officers, risk analysts, and decision-makers. This includes structured training programmes focused not only on the technical interpretation of psychometric scores and classification outputs, but also on their limitations, ethical considerations, and appropriate integration into existing credit screening processes. Building such competencies is essential to ensure that these tools are used as decision-support mechanisms rather than opaque ‘black-box’ systems.

In addition, IFIs should invest in the development of simplified, user-friendly interfaces that translate complex model outputs into actionable insights. For example, dashboard-based systems incorporating rule-based flags, risk indicators, and visual summaries can significantly enhance usability and facilitate real-time decision-making. This is particularly important in contexts like The Gambia, where technical expertise and digital infrastructure may be unevenly distributed across institutions. Crucially, capacity building should not be understood as a one-off intervention but rather as an ongoing institutional process. As models evolve and new data becomes available, continuous learning and adaptation will be necessary. By strengthening internal capabilities, IFIs can more effectively harness psychometric and data-driven tools to reduce information asymmetry, improve SME screening, and expand the use of Islamic participatory financing in a manner that is both technically sound and contextually grounded.

- ii. ***Integrate Psychometric Screening into SME Screening:*** The findings of this research provide strong empirical support for incorporating psychometric testing into SME screening processes, particularly within the context of Islamic participatory financing. Given the limitations of collateral-based lending in The Gambia where many SMEs operate informally, lack verifiable financial records, and possess limited fixed assets, psychometric assessment offers a viable complementary tool for evaluating entrepreneur quality,

behavioural traits, and managerial capability. The Islamic Financial Institutions in The Gambia should therefore move towards developing context-specific psychometric toolkits as part of their SME application and risk assessment frameworks. Such tools would enable IFIs to go beyond conventional financial metrics and incorporate behavioural indicators such as trustworthiness, entrepreneurial orientation, and financial discipline, all of which are critical in profit-and-loss sharing arrangements like *Mudarabah* and *Musharakah*. This shift is particularly important given that the research findings highlight the significant role of entrepreneurial and financial management skills in both firm performance and IFIs financing decisions.

However, psychometric screening should not be implemented as a standalone mechanism. Its effectiveness lies in its integration with existing financial indicators, qualitative assessments, and institutional knowledge. A hybrid screening framework combining psychometric, financial, and relational data would provide a more holistic and context-sensitive risk profiling system, thereby enhancing predictive accuracy and reducing information asymmetry. Given the relatively small number of players in The Gambian Islamic finance sector, there is also a strong need for coordinated implementation. The Central Bank of The Gambia, as the regulator and ecosystem builder, could play a catalytic role by supporting the development, validation, and standardisation of psychometric toolkits tailored to the local context. This may include providing technical guidance, facilitating pilot programmes, and ensuring that such tools align with broader financial inclusion objectives.

- iii. ***Develop Decision Rules Based on Evidence:*** Credit risk remains a central concern in all financing decisions, and this challenge is even more pronounced in Islamic participatory modes, where returns are contingent on actual business performance and where monitoring costs are inherently higher. In this context, decision rules generated through classification algorithms such as decision trees provide a valuable evidence-based framework to support credit assessment. However, these rules should not be interpreted as rigid or prescriptive decision-making tools. Rather, they should be treated as probabilistic and indicative guidelines that assist, but do not replace, human judgement. The findings of this study particularly the 78 per cent classification accuracy highlight both the usefulness and the limitations of algorithmic decision-making. A non-trivial margin of misclassification remains, which, if applied mechanically, could lead to the exclusion of viable SMEs or the inclusion of high-risk applicants.

Therefore, Islamic Financial Institutions in The Gambia should embed these decision rules within a broader, adaptive decision-making framework. This involves continuously validating and refining the rules using new data, incorporating qualitative insights such as relationship history, local reputation, and sector-specific knowledge, and allowing room for expert override where justified. In a context like The Gambia, where economic activity is deeply embedded in social relations and informal structures, over-reliance on purely algorithmic outputs risks overlooking critical non-quantifiable factors such as trust, moral conduct, and community standing. As such, decision rules should evolve iteratively, guided by ongoing evidence, institutional learning, and contextual understanding. This approach ensures that data-driven tools enhance rather than constrain the flexibility and inclusiveness of SME financing under Islamic participatory models.

- iv. ***Explore hybrid models and methodologies:*** The application of psychometric testing and data mining in the context of Islamic participatory financing remains at an exploratory and evolving stage, particularly within developing economies such as The Gambia. As evidenced in this study, while these tools show promise in mitigating information asymmetry and enhancing SME screening, no single methodological approach is sufficiently robust to capture the full complexity of SME behaviour, especially within socially embedded and largely informal economic systems. Therefore, Islamic Financial Institutions in The Gambia should adopt a pluralistic and experimental approach by exploring hybrid models that integrate multiple assessment techniques. This may include combining psychometric scoring with traditional financial ratios, behavioural indicators, transaction data (e.g., mobile money usage), and qualitative assessments such as relationship history and community reputation. Similarly, methodological diversity in data analysis such as blending regression models with machine learning classification techniques (e.g., decision trees, ensemble methods) can improve both predictive accuracy and interpretability.

Such hybrid approaches are particularly relevant in The Gambian context, where economic activity is deeply shaped by social networks, trust relations, and religious norms. A purely quantitative or purely qualitative model is unlikely to fully capture these dynamics. Instead, integrating multiple data sources and analytical frameworks allows IFIs to develop more context-sensitive screening mechanisms that reflect both the financial and moral dimensions of SME behaviour under Islamic finance. Ultimately, embracing methodological innovation and flexibility, will enable IFIs to move beyond rigid, one-size-fits-all credit assessment systems towards more adaptive, inclusive, and locally grounded

financing models that better support the expansion of Islamic participatory modes in The Gambia.

- v. ***Monitoring and Updating Models and Rules:*** The psychometric scores and decision rules derived in this study are inherently contingent on the quality, structure, and temporal relevance of the underlying data and modelling assumptions. As such, Islamic Financial Institutions in The Gambia should institutionalise dynamic feedback mechanisms to continuously evaluate the predictive performance of their classification systems. Specifically, outcomes from financing decisions (e.g., SME classification as suitable or unsuitable) should be tracked longitudinally and compared against actual firm performance and repayment behaviour. This iterative process would enable IFIs to recalibrate their psychometric instruments and decision-tree rules periodically, ensuring alignment with evolving market conditions, behavioural patterns, and regulatory developments. In a structurally fluid and predominantly informal economy such as The Gambia, static models risk rapid obsolescence due to shifts in entrepreneurial practices, socio-economic conditions, and institutional reforms.

Moreover, continuous model updating enhances not only predictive accuracy but also institutional learning, allowing IFIs to better capture context-specific indicators of trustworthiness, capability, and moral hazard. This is particularly critical in Islamic participatory financing, where outcomes are closely tied to the integrity and competence of the entrepreneur. By embedding adaptive learning systems into their risk assessment frameworks, IFIs can transition from rigid screening mechanisms to more responsive, context-aware financing strategies that reflect the realities of The Gambia's SME ecosystem.

**For Policy Makers:**

- i. ***Support Capacity Building for Data-Driven Decision-Making:***

The Central Bank of The Gambia, as the primary regulator of the financial system within which the Islamic Financial Institutions operate, has a critical role to play in enhancing the analytical capacity of the sector. The study findings suggest that traditional collateral-based and financial ratio-driven models, while important, are insufficient on their own in contexts characterised by information asymmetry and high informality. In this regard, the Central Bank can support the transition towards more data-driven and behaviourally informed credit assessment frameworks by investing in both infrastructure and human capital development. This includes organising targeted training programmes, technical workshops, and certification schemes aimed at

equipping IFIs with the necessary skills to integrate psychometric testing, predictive analytics, and data mining techniques into their credit risk evaluation processes.

Furthermore, policy support should extend to the development of shared analytical platforms and regulatory sandboxes, where IFIs can pilot and refine algorithmic models in a controlled environment. Such initiatives would enable continuous learning, model validation, and adaptation to the local SME context. Technical assistance may also be provided to facilitate model deployment, calibration, and ongoing algorithmic improvements, ensuring that these tools remain contextually relevant and empirically robust. From a broader perspective, this policy direction aligns with global trends in SME finance, where alternative data and fintech-driven approaches are increasingly used to overcome information gaps and expand financial inclusion (Berg et al, 2020; Frost et al, 2019). In the Gambian context, where formal financial records are often limited, leveraging psychometric and behavioural data offers a practical pathway to improving credit access while maintaining prudent risk management. By institutionalising data-driven credit assessment, the Central Bank would not only enhance the efficiency and inclusiveness of SME financing but also reduce over-reliance on collateral and subjective judgment. This represents a shift from asset-based lending to capability-based financing, which is particularly relevant for fostering the growth of SMEs within The Gambia's predominantly informal and trust-based economic environment.

- ii. ***Regulatory Framework for Participatory Financing:*** The strong influence of financial ratios on IFI decision-making ( $\beta = 0.53$ ) reflects the continued dominance of risk-based financial evaluation frameworks, even within Islamic finance. This is largely due to information asymmetry and weak institutional infrastructure, which constrain the ability of financiers to rely on trust-based mechanisms (Beck and Demirgüç-Kunt, 2006). Given the distinctive nature of Islamic participatory financing modes particularly *Mudarabah* and *Musharakah*, which are based on risk-sharing, there is a clear need for a dedicated and context-specific regulatory framework that accommodates these instruments. In the absence of such a framework, IFIs are more likely to regress into conventional, risk-averse financing approaches that prioritise financial metrics over partnership-based evaluation. The Central Bank of The Gambia should, therefore, take a leading role in developing a national Islamic finance regulatory framework that explicitly recognises and supports participatory financing models. In the Gambian context, weak legal enforcement and contract uncertainty can discourage IFIs from adopting participatory modes. Strengthening contract enforcement mechanisms and Shariah governance frameworks is therefore essential (Othman et al, 2023). This will help transform Islamic finance in The Gambia

from merely normative approach to a more institutionalised system. The current state of Islamic finance in The Gambia can therefore be described as normatively present but institutionally constrained. While the principles of Islamic finance are widely understood and valued, their practical implementation is hindered by regulatory and structural deficiencies. Hence, by developing a robust legal and regulatory framework, the Central Bank can facilitate a transition from a symbolic or aspirational model of Islamic finance to a fully institutionalised system, capable of supporting SME growth and financial inclusion.

- iii. ***Encourage Standardisation of SME Psychometric and Other Innovative Tools:*** The empirical results of the study indicate that financial ratios remain the dominant determinant of IFI decision-making ( $\beta = 0.53$ ), reflecting a continued reliance on traditional risk-based evaluation frameworks. This dominance is largely driven by information asymmetry, weak institutional infrastructure, and the absence of reliable alternative data sources, which limit the ability of financiers to adopt trust-based or partnership-oriented financing models (Beck and Demirgüç-Kunt, 2006). However, the findings also demonstrate that psychometric variables, particularly financial management skills and entrepreneurial competencies, provide meaningful explanatory power in predicting both firm performance and financing outcomes. This suggests that incorporating behavioural and capability-based indicators into credit assessment can significantly enhance decision-making, especially in contexts like The Gambia where formal financial records are often incomplete or unreliable. In this regard, the Central Bank of The Gambia should take proactive steps to support, standardise, and legitimise the use of innovative credit assessment tools tailored to SME financing and Islamic finance principles. Standardisation is particularly important to ensure that such tools are not used arbitrarily but rather are grounded in rigorous statistical validation and contextual relevance. This would also enhance confidence among IFIs, regulators, and SME operators, thereby promoting wider adoption.

Encouraging the use of psychometric and data-driven tools represents a strategic shift from asset-based lending toward capability-based financing, which is more aligned with the principles of Islamic participatory finance. In environments characterised by high informality and limited financial transparency, these tools can serve as effective mechanisms for reducing information asymmetry and mitigating moral hazard. By institutionalising their use, the Central Bank can foster a more inclusive, innovative, and resilient SME financing ecosystem in The Gambia.

- iv. ***Promote Collaboration and Information Sharing:*** The findings of the study highlight the persistent challenges of information asymmetry and fragmented SME credit data

environments, which contribute to the continued dominance of financial ratio-based lending ( $\beta = 0.53$ ). In the absence of reliable and shared information systems, Islamic Financial Institutions are constrained in their ability to adopt alternative, trust-based, or capability-driven financing approaches (Beck and Demirgüç-Kunt, 2006). As the custodian of the financial system, the Central Bank of The Gambia is uniquely positioned to foster collaboration, coordination, and data-sharing mechanisms among key stakeholders, including IFIs, commercial banks, microfinance institutions, development partners, and SME support agencies.

- v. ***Provide Legal Frameworks for Alternative and Integrated Risk Assessment:*** Without compromising prudential risk governance, policymakers particularly the Central Bank of The Gambia, should undertake targeted legal and regulatory reforms to accommodate innovations in SME risk assessment. This is especially critical given the structural importance of SMEs within The Gambia's economy and their persistent exclusion from formal finance. Such reforms should include the enactment of comprehensive data protection and privacy laws, alongside clear regulatory provisions that legitimise the ethical use of psychometric data and alternative data sources in credit decision-making. This aligns with emerging global practices in financial innovation, where alternative data has been recognised as a viable mechanism to reduce information asymmetry and expand financial inclusion (Klinger et al., 2013; Miliūnaitė, 2023). However, without a proper legal framework, the use of such tools, risks undermining trust and exposing both institutions and entrepreneurs to ethical and operational vulnerabilities.

In addition, regulators should develop structured oversight mechanisms and regulatory sandboxes that allow Islamic Financial Institutions to experiment with integrated risk assessment models combining traditional financial metrics with behavioural and data-driven indicators. Evidence from financial development literature suggests that weak institutional environments particularly in areas such as contract enforcement and information infrastructure, significantly constrain financial innovation and access to credit (Beck & Demirgüç-Kunt, 2006). In The Gambian context, these issues are particularly pronounced. The economy is characterised by a high degree of informality, relationship-based transactions, and limited credit information systems, which collectively reinforce conservative lending practices and discourage the adoption of participatory Islamic financing modes. As a result, IFIs tend to relapse into low-risk, debt-like instruments rather than equity-based contracts such as *Mudarabah* and *Musharakah*, despite their theoretical alignment with SME financing needs.

By promoting collaboration, data-sharing frameworks, and institutionalised information systems such as SME credit registries and movable collateral registries, the Central Bank can facilitate the transition from relationship-based to evidence-based lending ecosystems. These mechanisms are essential for reducing systemic risk, improving credit evaluation accuracy, and enabling the scaling of innovative financing approaches. Embedding these reforms within a coherent regulatory architecture, would support the evolution of Islamic finance in The Gambia from a largely normative and identity-driven system to a fully institutionalised component of the national financial architecture. This transformation is central to advancing financial inclusion, SME development, and broader economic resilience,

In summary, while psychometric testing and data mining offer technical solutions to SME risk assessment, their effectiveness depends on alignment with the structural realities of The Gambia's financial system. From a political economy perspective, The Gambian SME sector operates within a hybrid institutional environment where formal regulatory systems coexist with informal practices, social networks, and religious norms. As highlighted in Chapter 9, trust, willingness, and knowledge are not merely individual attributes but are socially embedded and influenced by cultural, religious, and economic realities. In such a context, psychometric tools must be carefully contextualised, as their predictive power may be constrained by factors external to the firm, including access to informal finance, kinship obligations, and market volatility (Jabanj and Basso, 2024). Without addressing systemic issues such as informality, weak legal enforcement, and limited financial inclusion, these tools risk remaining marginal rather than transformative. Thus, the IFIs should adopt the tools gradually within local constraints and the regulators should act as ecosystem builders rather than mere supervisors and finally SME entrepreneurs need to improved record-keeping, transparency, and governance practices are essential to fully benefit from innovative financing models, particularly those based on risk-sharing principles.

## **10.5 Future Research Direction**

This research set out to evaluate the potential of psychometric testing and data mining as innovative supplementary approaches for enhancing SME assessment and promoting the adoption of Islamic participatory modes of financing. While the study provides compelling empirical insights with important implications for practitioners and policymakers, it also opens several avenues for future research.

First, future studies should expand the geographical scope beyond The Gambia to include comparative analyses across countries with varying levels of Islamic finance development and institutional quality. Such cross-country studies would help to assess the generalisability of the findings and identify how different regulatory, cultural, and financial ecosystems influence the effectiveness of psychometric and data-driven tools (Beck and Demirgüç-Kunt, 2006). Within The Gambia, further research could also adopt a regional or sectoral lens, particularly focusing on high-risk sectors such as agriculture and manufacturing, which were underrepresented in this study.

Second, there is a strong need for methodological advancement, particularly in addressing potential endogeneity and reverse causality between key variables such as trust, skills, and firm performance. Future research could employ more robust econometric techniques such as instrumental variable (IV) approaches, panel data models, or structural equation modelling (SEM) to better capture causal relationships and latent constructs (Wooldridge, 2010; Kline, 2015). Longitudinal datasets would be especially valuable in disentangling dynamic relationships, such as whether trust drives performance or whether successful firms are perceived as more trustworthy *ex post*.

Third, given the importance of informality and social embeddedness in The Gambian SME sector, future studies should explicitly incorporate variables related to informal finance, social networks, and community-based institutions. As highlighted in this study, SME behaviour is deeply embedded in social and religious contexts and excluding these dimensions may limit explanatory power (Jabanj and Basso, 2024). Integrating insights from economic sociology and development studies would allow for a more holistic understanding of SME financing behaviour.

Fourth, future research should explore alternative approaches to measuring psychometric constructs. While this study utilised a five-point Likert scale, future researchers could adopt more behaviourally grounded tools such as situational judgement tests (SJTs) or experimental methods, which may better capture real-world decision-making and reduce social desirability bias (Lievens et al., 2008). In addition, mixed-method approaches combining quantitative surveys with qualitative interviews could provide deeper insights into how entrepreneurs interpret and respond to psychometric assessments.

Fifth, there is scope for further research on the institutional and regulatory dimensions of Islamic finance, particularly in emerging markets like The Gambia. Future studies could

examine how legal frameworks, Shariah governance structures, and enforcement mechanisms shape the adoption of participatory financing models (Othman et al., 2023). This would help bridge the gap between the normative ideals of Islamic finance and its practical implementation.

Finally, future research should explore the integration of advanced data analytics and machine learning techniques, including ensemble models, neural networks, and hybrid decision-support systems, to improve prediction accuracy and model robustness. However, such technological advancements should be evaluated within the constraints of data availability, regulatory capacity, and institutional readiness in developing economies.

In sum, future research should move beyond purely technical modelling and adopt a more interdisciplinary and context-sensitive approach, integrating econometric rigour, behavioural insights, and institutional analysis. This will ensure that innovations in SME financing particularly those aligned with Islamic participatory principles are not only methodologically sound but also practically relevant within the socio-economic realities of The Gambia and similar contexts.

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