

## Constructing Indicators For Islamic Financial Inclusion

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### Abstract

*This study conceptualizes and proposes the measurement items and constructs for assessing the financial inclusion of Islamic finance. It proposes and validates the demand-side measurement tool for the financial inclusion of Islamic finance using four dimensions, i.e., quality, accessibility, usage, and satisfaction. The measurement instrument proposed in this study assesses the actual performance of Islamic finance towards total financial inclusion. The study was based on exploratory factor analysis of the questionnaire responses collected from 129 respondents. The questionnaires were distributed to the Zanzibar residents from February 2021 to March 2021. The questionnaires are adapted mainly from the Findex Survey (2017). The financial inclusion of Islamic finance can be determined using four dimensions (components); relevancy (quality) of Islamic financial services, accessibility of Islamic financial services, usage of Islamic financial services, and satisfaction with Islamic financial services. The study is limited to Principal Components Analysis as a factor analysis approach. Besides, the study has been conducted in Zanzibar, a semi-autonomous nation in East Africa. Therefore, more comprehensive studies are required in various areas for generalizing the results.*

**Keywords:** Financial Inclusion, Literacy Indicators, Islamic Finance, Principal Component Analysis

### A. Introduction

There are plethora of studies identify the nature of financial inclusion and the extent to which people have access to financial services in various economies (Arora, 2010; Demirgüç-Kunt, Klapper, Singer, Ansar, and Hess, 2018; Sarma, 2008; Sarma and Pais, 2011). Studies have also focused on the determinants of financial inclusion in various economies (Oumaa, Odongo, and Were, 2017; Nuryakin *et al.*, 2018; Datta and Singh, 2019; Shinkafi *et al.*, 2019). Besides, financial inclusion contributes to the global economy by bringing a large amount of money; and has a significant relationship with tax revenue (Oz-Yalaman, 2019). Consequently, financial policies and financial inclusion frameworks (FIFs) have been designed to support financial inclusion strategies in different economies (Karp and Nash-Stacey, 2015; Bhuvana and Vasantha, 2016; Furman, 2016; Zhu, Zhai, and He, 2018). Nevertheless, there is much to be done from an academic perspective to push forward the academic frontier in financial inclusion.

Among others, the role of Islamic financial systems as a determinant of financial inclusion requires further exploration (Abu-Seman, 2016; Jouti, 2018). Most prior studies rely

on the basic principles of Islamic finance rather than discovering the actual impact of Islamic finance on financial inclusion to the community. Conceptually, Islamic finance can impact financial inclusion through its welfare-based financing approaches, which promote social and economic justice; consider fair wealth distribution and the role of the state (Ayub, 2007; Iqbal, 2014). Besides, studies confirm the significance of Islamic finance on financial inclusion due to the uniqueness of its products and services, which, among others, meet the religious demand of Muslims (Iqbal, 2014; Naceur, Barajas and Massara, 2015; Mustafa, Baitaa, and Usmand, 2018; Hassan *et al*, 2019). However, some evidence indicates a low rate of financially included people in many Muslim majority areas, even where Islamic finance is at the higher development stage (Demirguc-Kunt, Klapper, and Randall, 2013; Zulkhibri, 2016; Demirguc-Kunt *et al*, 2018; Nawaz, 2018).

Essentially, realizing the actual impact of Islamic finance on financial inclusion requires deliberate efforts. It is essential to understand people's profiles and create awareness about Islamic financial products and services (Jouti, 2018). The financial institutions should also review their models of operations and enhance social infrastructure (Hassan *et al.*, 2019, Zulkhibri, 2016). Additionally, financial inclusion is determined by these three key dimensions: banks' penetration (accessibility), availability, and usage (Sarma 2008; Arora, 2010; Goeland Sharma, 2017). Thus, it is also essential to assess the accessibility, efficiency, affordability, and usability of Islamic finance in a country.

Commonly, researchers rely on banks' reports to determine the extent of bank penetration, availability, and usage (Demirguc-Kunt and Klapper, 2012). However, collecting customers' responses is the most appropriate way to understand the acceptance and usage of financial services rather than relying on bank data (Demirguc-Kunt *et al*, 2018; Nigam, 2018). Among the limitations, banks' reports are subjective and lack customers' actual responses (Nigam, 2018). Subsequently, the World Bank designed a Findex questionnaire to collect people's responses about various economies' accessibility, uptake, and usage of financial services. Nevertheless, it is essential to design a comprehensive tool to collect people's responses about the services offered by Islamic financial institutions.

The Findex questionnaire developed by World Bank (2018) provides a significant base for assessing financial inclusion, as referred to by many prior studies. The Findex questionnaire describes the characteristics of individuals about their involvement in financial services. It is designed to capture the extent of uptake, accessibility, usage, and experience of using financial services among individuals. Subsequently, prior studies took a great effort to develop measurement tools for accessing demand-side studies on financial inclusion in an academic perspective e.g., Mindra and Moya (2017); Bongomin and Ntayi (2018). However, the present measurement tools do not consider the specific features of Islamic finance and its product. Given its specific features, it is crucial to develop specific instruments to assess the financial inclusion of Islamic finance. Specifically, the financial inclusion of Islamic finance can be achieved through the availability and efficient operations of Islamic financial institutions based on distributive mechanisms, profit and loss sharing products, and *shari'ah* compliant modes of financing (Zulkhibri, 2016; Bank Negara Malaysia, 2017). Ali, Sakti, and Devi (2019) developed

Indonesia's Islamic financial inclusion index. Using the bank data, Ali *et al.* (2019) constructed three dimensions of Islamic financial inclusion, i.e., accessibility, availability, and usage. Hitherto, the literature lacks a comprehensive demand-side tool to assess the financial inclusion of Islamic finance.

Therefore, we cover the existing knowledge gap by exploring the measurement items for assessing the financial inclusion of Islamic finance. This study involves specific features and products of Islamic finance to propose measurement tools for the financial inclusion of Islamic finance. Along with Islamic banking services, this study considers the accessibility, availability, and usage of other Islamic financial services, i.e., Islamic insurance, Islamic microfinance, as well as *zakat*, *sadaqat*, and *waqf* institutions, to develop measurement instruments for financial inclusion of Islamic finance.

The study is based in Zanzibar, the potential Islamic finance market in East Africa. Many banking and insurance institutions continue to offer Islamic finance services in Zanzibar. Besides, conventional banking, insurance, and other forms of financial services have been in place for decades. Nevertheless, the financial exclusion rate is slightly high in Zanzibar, as the case is in rural parts of Tanzania's mainland (FinScope -Tanzania, 2017). Approximately 43% of the adult population are financially excluded in Zanzibar, and for Tanzania mainland, the exclusion rate is 28% (FinScope -Tanzania, 2017). Besides, self (voluntary) financial exclusion is higher than involuntary exclusion. The socio-economic profile of the people might have affected the financial inclusion rate in Zanzibar. In addition, the shortage of *Shariah* compliance services is among the main reasons for self-exclusion in Zanzibar, among others (FinScope-Tanzania, 2017). Therefore, it was presumed that appearance Islamic banking and finance could convince a large group of people to engage in financial services.

Generally, the financial sector in Zanzibar is proliferating. The current improvement of financial sectors is the result of the National Financial Inclusion Framework (NFIF) II (2018-2021) and the Zanzibar strategy for growth and reduction of poverty 2016-2020 (ZSGRP III). NFIF II and ZSGRP III intended to minimize the barriers to financial excess, hence promoting the uptake and usage of banking and other financial services in Zanzibar and Tanzania, in general. In addition, the growing trends of Islamic banking services were expected to reduce the financial exclusion gap to a large extent. It has been almost 13 years (2008 to 2021) since the introduction of Islamic banking services in Zanzibar. Thus, it is significant to assess the actual effect of Islamic finance on financial inclusion.

## B. Literature Review

### 1. Financial inclusion

The World Bank (2018) the access to functional (relevant) and affordable financial services and products by individuals and businesses (Denigruc-Kunt *et al.*, 2018; Ernest and Young 2018). Based on the definition, financial services shall meet the specific needs of individuals and businesses. The financial service providers shall be responsible and focus on the sustainability of the financial service provided. Furthermore, in an inclusive financial

system, everyone in the community can benefit from the available financial services without much discrimination (Denigruc-Kunt *et al.*, 2018; Ernest and Young, 2018).

Broadly, an inclusive financial system ensures that financial institutions essentially cover social and economic welfare. Financial inclusion should focus on the provision of credit and focus on increasing productivity and sustainability of formal and other vulnerable groups (Mahendra, 2006). Besides, financial inclusion is affected by the community's social, economic, and demographic characteristics. Due to the differences in demographic, social, and economic factors, the Findex survey 2017 reported variations in financial inclusion among individuals and communities (The World Bank, 2018). Therefore, it is recommended to consider a specific community's personal and environmental factors while discussing the issues of financial inclusion (Jouti, 2018). In addition, the nature of the financial system should be considered while discussing financial inclusion issues; to better understand its effect on financial inclusion (Abu-Seman, 2016).

## 2. Measuring financial inclusion

Generally, most early studies use supply-side data to measure financial inclusion. The studies show that, in any country, financial inclusion is determined by the penetration, availability, and usage of banking services (Sarma 2008; Arora, 2010; Goeland Sharma, 2017). Sarma (2008) determined the financial inclusion index using three dimensions: bank penetration, availability, and usage. Penetration is measured by the number of people having a bank account; the availability dimension measures the convenience of access to banking services; the usage dimension measures the extent to which bank account holders use their account for financial transactions. Arora (2010) built a financial access index by determining financial inclusion in terms of outreach (physical access), ease of transactions, and cost of transactions. The Early definition of financial inclusion mainly focused on banking services. Subsequently, Goel and Sharma (2017) added access to insurance services as an essential aspect in determining financial inclusion.

Many studies have been done to assess financial inclusion using survey studies at the individual level (demand-side) in recent years. The most commonly used financial inclusion indicators are adopted through Findex Survey (2013 and 2017). Generally, Findex surveys provide the basis for measuring financial inclusion at the demand-side, i.e., using customer responses regarding financial service accessibility and usability (Denigruc *et al.*, 2013; Denigruc *et al.*, 2018). The Findex survey questionnaire is designed to assess the level of access, uptake, and usage of banking services by individual people. Similarly, demand-side studies categorized financial inclusion indicators in three dimensions: accessibility of financial services; quality (relevancy) of financial services; and usage of financial services (Mindra and Moya, 2017). Besides, other studies added the welfare of financial services among the dimensions of financial inclusion (Bongomin and Ntayi, 2019). In Tanzania, the National Financial Inclusion Framework (NFIF) 2018-2022 identified five measures of financial inclusion, namely: welfare, satisfaction, usage, uptake, and accessibility, as represented in Table 1.

Table 1 Common measurement items of financial inclusion from previous studies

Author and Year	Main Constructs	General measurement Items
Bongomin, Munene, Ntayi and Malinga (2018); Bongomin and Ntayi (2019)	Access, Usage, Quality, Welfare	Adults have accounts with financial institutions Positive impact on the welfare of users: improved livelihood: more resilient household; expanded job creation.
Demugruc-Kunt, <i>et al.</i> (2013, 2017) NFI (2018-2022)	Welfare, satisfaction, usage, uptake, accessibility	Financial services meet customers' needs. People use financial services to save, borrow, transact, and mitigate financial risk.
Mindra and Moya (2017)	Accessibility, Usage, Quality	people have had activities in their accounts in the past six months confident in dealing with FS service centers are close to people adults own mobile phones adults have unique and verifiable identification Adults have their profiles in the integrated reference system.

### 3. Financial inclusion of Islamic finance

Islamic finance has a great potential of increasing access to financial services, minimizing the poverty level and the dependence rate among individuals and communities (Demirguc-Kunt *et al.*, 2013). Islamic finance embraces a welfare-based system that considers wealth distribution, economic justice, social justice, and the state's role, which is significant for economic empowerment (Abu-Seman, 2016). Accordingly, Islamic finance is an effective avenue for financial inclusion (Naceur *et al.*, 2015). Islamic financial institutions address financial inclusion issues by effectively utilizing their resources. Prior studies confirmed the significant relationship between financial inclusion and Islamic financial instruments and products (Nawaz, 2018). Indeed, the impact of Islamic finance on financial inclusion is primarily evidenced in Muslim majority countries, e.g., Saudi Arabia, Malaysia, UAE, Kuwait, Qatar, Turkey, Indonesia, Bahrain, and Pakistan (Mustafa *et al.*, 2018). The Islamic financial services in Muslim majority countries have made significant development; hence, meeting the religious demand for Muslims (Naceur *et al.*, 2015; Ali *et al.*, 2019).

Islamic finance contributes to financial inclusion through two pillars: re-distributive pillars and risk-sharing pillars (Zulkihibri, 2016). The risk-sharing pillars represent profit and loss sharing financing approaches, and the re-distributive pillars represent "Islamic social finance instruments" (Ali *et al.*, 2019). Re-distributive pillars include *Zakat*, *Sadaqat*, *Qard-al Hasan*, *Waqaf*, *Khairat*, and *Khumus*. The profit and loss sharing financial products involve Islamic microfinance (*Murabaha*, *Musharaka*) and Islamic micro-insurance (*micro-Takaful*), among others (Iqbal, 2014; Zulkihibri, 2016; Ali *et al.*, 2019). An inclusive Islamic financial

system should have vital initiatives to profit and loss sharing modes of finances that minimize financial access barriers to poor people. In addition, there should be firm and easily accessible social financing institutions that manage the collection and the distribution of wealth from rich people to the poor in accordance with Islamic principles.

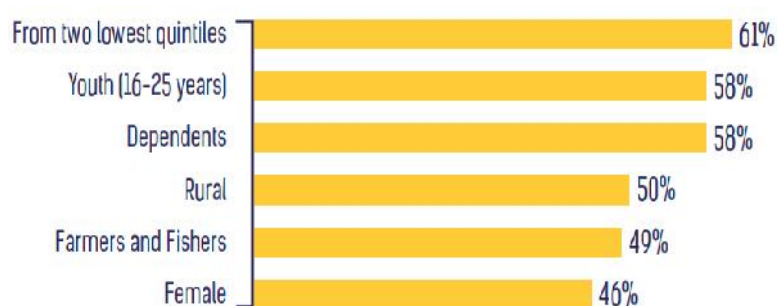
Specifically, the financial inclusion of Islamic finance requires solid and efficient availability of profit and loss sharing modes of finance. Besides, it requires the existence of financial institutions which embrace the provision of *zakat*, *Sadaqat*, *Waqfu*, *Qard al Hasan*, etc. (Mirakhor and Iqbal, 2012; Iqbal, 2014; Iqbal and Sami, 2017). Indeed, the assessment of financial inclusion of Islamic finance should consider the accessibility, availability, and usage of Islamic financial services. The accessibility dimension measures the penetration of Islamic banks to low-income people. The availability dimension measures the extent to which Islamic banking services are available to low-income people. Usage dimension measures the level of people's satisfaction with Islamic financial services (Ali *et al.*, 2019).

#### 4. Financial inclusion in Zanzibar

Zanzibar is a semi-autonomous nation in East Africa. It is part of the United Republic of Zanzibar. Zanzibar is made of two main islands (Unguja and Pemba) located on the Eastern coast of the Indian Ocean. Historically, Zanzibar has been long colonized by Arabs from Oman, hence adopting most of its culture from Oman. As a result, about 98% of the residents are Muslims. The Zanzibar population is 1.6 million, of which the adult population makes 58% of the total population (OCGS-Zanzibar, 2019). The financial sector plays a significant role in promoting the economic development and welfare of Zanzibar residents. There has been an increased interest in financial institutions to open branches in Zanzibar in recent days. Because of increased demand and financial institutions, including banks, insurance, and mobile money, companies have opened business ventures. Currently, there are 12 banks in Zanzibar (Shkeilly and Abdullah, 2021). Insurance agencies are operated under the authority of Zanzibar Insurance Corporation. Either, the establishment of financial service agents, mobile money, and enhanced internet facilities have to a large extent reduced barriers to financial access. Currently, essential financial services are regularly available even in rural areas.

According to FinScope-Tanzania (2017), about 55% of Zanzibar adults are financially excluded. The excluded people either do not have an account or use formal financial services (FinScope-Tanzania, 2017). Besides, the demographic profile is an essential determinant of financial inclusion in Zanzibar; certain groups of people are highly financially excluded compared to others. In Zanzibar, the most financially excluded people are poor from the lowest quintiles and youth aged between 16 to 25 years. Likewise, female dependents, rural residents, fishers, and farmers are among the most financially excluded groups in Zanzibar (Figure 1).

Figure 1: Financially excluded groups in Zanzibar based on demographic profiles



Source: FinScope-Tanzania, 2017

Generally, Zanzibar's social and cultural environment created specific financial needs for customers. As a result, fulfilling specific financial needs is a unique opportunity to enhance financial inclusion in Zanzibar. More than 98% of Zanzibar residents are Muslims (Shkeily and Abdullah, 2021), and religion is vital in making financial decisions. Nevertheless, the conventional financial systems still dominate the financial market despite the growing trend of Islamic banking services in Zanzibar. Hitherto, Zanzibar people are financially excluded due to a lack of relevant Islamic financial services, among other reasons (FinScope-Tanzania, 2017). Hopefully, the growing pace Islamic finance industry will reduce the gap between financial inclusion and exclusion. (FinScope-Tanzania, 2017).

## 5. Islamic Finance in Zanzibar

The banking system has a long history in Zanzibar since colonial rule. As part of the united republic of Tanzania, the Zanzibar banking system is regulated by the bank of Tanzania (BOT) through the laws and regulations enacted by the Tanzania Parliament. However, there are certain non-union matters that Zanzibar regulates by its constitution, laws, and regulations. Conventional banking and financial regulations (Omar and Yusoff, 2019). The Islamic financial services in Zanzibar were first introduced in 2008 by the Peoples' Bank of Zanzibar (PBZ). Currently, about four banks offer Islamic banking services in Zanzibar, namely, PBZ, Kenya commercial bank (KCB), National Bank of Commerce (NBC), and Amana bank. The Amana bank is the only full-fledged Islamic bank in Zanzibar; it started operations in 2018. The PBZ started to offer Islamic banking through the Islamic banking window; KCB started to offer *Sahl* banking services in 2011; NBC offered the "*La riba*" current account (Omar, Yusoff, and Sendaro, 2017; Shkeilly and Abdullah, 2021).

Besides, establishing Islamic insurance (*Takaful*) services is in progress. The bank of Tanzania has made an effort to establish a law that enables institutions to offer Islamic insurance services in Tanzania. Subsequently, some insurance companies have already shown interest in offering *Takaful* services. For example, Zanzibar Insurance Corporation (ZIC) is considering providing Islamic insurance services to customers; and has applied for the license from BOT in 2019. However, challenges which include: lack of awareness about Islamic insurance, inadaptability of people, and fear of competition from conventional

insurance, resulted in the delay of establishment of Islamic insurance in Zanzibar. The increasing trends of awareness and demand for Islamic financial services will push financial service providers to start as soon as possible to offer *Takaful* services. Apart from Islamic banking and insurance, other micro-financial services providers adopt the Islamic finance models such as saving and credit cooperative societies (SACCOs). An excellent example of the SACCOs adopting a *Shariah* compliant finance mode is "Watanga SACCOS " through its motto "*huduma bi la riba*" which means "the services without interest." Interest-free SACCOs have attracted many people to join the SACCOS.

Moreover, *Waqf* and *Zakat* institutions have long been established since Oman's rule in Zanzibar. Despite operational challenges, *Waqf* and *Zakat* institutions are now becoming solid and beneficial to the public; and the government is putting effort into strengthening their operations. *Waqf* and *Zakat* institutions intend to voluntarily collect wealth and properties to help the poor and the needy and control and manage properties for the benefit of the Muslims community.

Islamic finance in Zanzibar has excellent potential due to its religious profile and cultural background. Findex survey (2017) documented clearly that religion and culture are the key drivers of financial inclusion in Zanzibar. Specifically, people mentioned the lack of Islamic financial services for not engaging in traditional banking services. However, more effort is required to solve the present legal and operational challenges; create awareness to people; and conduct more research to explore further improvement needs on Islamic finance (Salim, 2012; Mzee, 2016; Omar, Yusoff, and Sendaro, 2017).

### C. Research Methodology

The data was collected using questionnaires. The questionnaire items were adapted from previous financial inclusion studies, and changes were made to reflect Islamic finance's fundamental characteristics. The questionnaire items were adapted from the World Bank's Findex Survey (2017), the studies by Mindra and Moya (2017), Bongomin and Ntayi (2019). In addition, the study adapted specific features of financial inclusion in Islamic finance from previous studies by Mirakhor and Iqbal(2012); (Zulhibri (2016); Ali *et al.* (2019). The questionnaire consists of 23 items designed to collect peoples' opinions about the accessibility, relevancy (quality), usage, satisfaction, and welfare of Islamic financial services. Accordingly, the financial inclusion of Islamic finance is determined by the availability and efficiency of specific Islamic mechanisms such as *Waqf* (endowment), *Zakat* (almsgiving), *Qard-al Hassan* (benevolent loans), and profit and loss sharing financing models. Before data collection, the questionnaire was submitted to experts and university lecturers for validation. The validation was performed by experts and lecturers from finance, Islamic finance, and financial inclusion. Their comments were taken into consideration, and the questionnaire contents were improved.

The data were collected between January 2021 to March 2021. Self-administered questionnaires were randomly distributed to Zanzibar residents aged 18 years and above. About 200 questionnaires were distributed, and 129 were received and used for the analysis. Data were collected in the urban west and eastern regions in Zanzibar-Unguja. Specifically, data were



collected directly from residential areas, working areas, and at the state university of Zanzibar (SUZA), where respondents were conveniently accessible. The study used SPSS to analyze the responses from the questionnaires and report descriptive and exploratory factor analysis.

#### **D. Result And Discussion**

##### **1. Exploratory Factor Analysis**

The study used Exploratory Factor Analysis (EFA) to propose measuring Islamic financial inclusion. EFA is a multivariate statistical technique that models the structure of observed variables. Among the data reduction techniques designed to elucidate large numbers of observed variables to few significant factors. EFA is widely used in determining the quality, reliability, and validity of the items in measurement instruments. Besides, EFA is used to assess the extent to which items in the measurement scale reflect an underlying hypothetical factor (Costello and Osborne, 2005; Salkind, 2010). In EFA, the items are classified based on their degree of correlation and statistical influences to each other. EFA uses factors (components) and factor loadings to represent variables and the associations between the variables. In EFA, components (factors) represent unobserved (latent) variables, and factor loadings represent the relationship between unobserved or observed variables (Field, 2015).

In EFA, there are several applicable extraction methods. Among others, Principal Components Analysis (PCA), Principal Factor Analysis (PAF), and Maximum Likelihood (ML) are standard and available in most statistical packages such as SAS and SPSS. However, Costello and Osborne (2005) argued that PCA is not a proper factor analysis method; it is merely a data reduction technique. Instead, ML and PAF are the most suitable techniques for factor analysis depending on the degree to which the data set follows a normal distribution. ML is best if the data are relatively normally distributed. Alternatively, PAF is useful when the normality of the data is severely violated (Costello and Osborne, 2005). Some researchers favor PCA because it is more suitable and provides a clear picture of the structure and loading of the variables. Many researchers used PCA to perform factor analysis (Coakes, 2011). Besides, PCA minimizes the risk of factor indeterminacy, a common problem during the factor analysis process (Stevens, 2009). Therefore, this study used PCA to determine the structure of the measurement items of financial inclusion of Islamic finance. The study intends to determine sufficient and more meaningful measurement scales of financial inclusion of Islamic finance. The use of PCA provides strong justification for the items deleted or accepted from the dataset.

Further, it is crucial to determine the inter-correlation of the items and the sample adequacy in determining the effectiveness of performing factor analysis (Field, 2015; Harman, 1976). The data-richness is an essential concern for the validity of factor analysis results. The study used Kaiser Meyer Olkin's (KMO) to measure the sampling adequacy and Bartlett's test of Sphericity to assess the suitability of the dataset. The results are presented in the subsequent paragraphs.

## 2. Respondents' profile

In this study, respondents' demographic profiles are determined by gender, age, marital status, religion, level of education, employment status, and monthly income level. As well, the study shows the relationship of respondents with financial institutions. These variables describe the socio-economic status of a person, hence, are essential in a person's financial decision-making. The demographic profiles of respondents are provided in Table 2. The results show that the male respondent rate is relatively high (51.9%) compared to female (48.1%); most respondents are young aged between 18 to 49 years (aggregated 99.2%), respondents aged 60 and above are 0.8%. The marital status of respondents indicates a large number of respondents are not married (76.7%), whereby 18.6% are married, 3.9% are divorced, and 0.8% are a widow. A significant percentage rate of unmarried respondents may reflect that many respondents are young.

The results show that only 35.7% are customers of Islamic financial institutions, and the remaining 64.3% are not subscribed to any products of any Islamic financial institution. Respondents' profile also shows that many respondents have attained higher levels of education: bachelor degree 72.9%, ordinary diploma 11.65%, postgraduate 5.4%, and advanced secondary education 4.7%. Only 1.6% of respondents have not attended any school. The employment status shows that 55% of respondents are students, and 22.5% have no job, whereas 14% are employed; 5.4% are businessmen; 1.6% are shopkeepers; 0.8% are retired, and 0.8% are farmers/fishermen. The monthly income of many respondents (about 88.3%) ranges from less than TZS 300,000 to 499,999, equivalent to approximately US\$ 130.4 to US\$ 217.4; only about 9.9% of respondents receive a monthly income of between TZS 500,000 to 3,000,000 equivalent to US\$21.4 to US\$ 1,304.4.

Table 2 Respondents' profiles

S/N	Variable		%
1	Gender	Male	51.9
		Female	48.1
2	Age	18 to 29 years	79.1
		30 to 39 years	17.8
		40 to 49 years	2.3
		50 to 59 years	0.0
		60 and above	0.8
3	Marital status	Married	18.6
		Not married	76.7
		Divorced	3.9
		Widow	0.8
4	Religion	Muslim	92.2
		Non-Muslim	7.8
5	Relationship with Islamic financial institution	Customer	35.7
		Not a customer	64.3
6	The highest level of	Not attended any school	1.6

	education completed	Ordinary secondary education	2.3
		Advanced secondary education	4.7
		Basic/technical certificate	1.6
		Ordinary diploma	11.6
		Bachelor Degree	72.9
		Post Graduate	5.4
7	Employment status	No job	22.5
		Student	55.0
		Employee	14.0
		Businessman	5.4
		Farmer/Fisherman	.8
		Shopkeeper	1.6
		Others	0.8
8	Monthly income (@ the exchange rate of TZS/USD =2,300)	Less than TZS 300,000	70.5
		TZS 300,000 to 499,999	17.8
		TZS 500,000 to 999,999	4.7
		TZS 1000,000 to 1,999,999	3.9
		TZS 2000,000 to 2,999,999	1.6
		TZS 3000,000 to 4,999,999	0.8
		TZS 5,000,000 and above	0.8

### 3. Principal Component Analysis (PCA)

The KMO and Bartlett's Test is used to determine the adequacy of performing factor analysis from the data set. The KMO and Bartlett's Test (Table 3) confirm the suitability of data for performing factor analysis (FA). The sampling adequacy measure (KMO) value is 0.843, which is above the threshold of 0.5 (Field, 2015). The Bartlett's Test of Sphericity is significant ( $P < 0.05$ ), with an approximate Chi-Square of 1646.7743 and degree of freedom (df) 253, indicating that the EFA is beneficial for the data (Coakes, 2011; Field, 2015; Harman, 1976). From Table 2, the KMO and Bartlett's test confirmed the suitability of performing EFA.

Table 3 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.843
Bartlett's Test of Sphericity	Approx. Chi-Square	1646.743
	df	253
	Sig.	.000

The results for PCA are provided in Table 3. In PCA, it is recommended to set SPSS to suppress the absolute value of items loading below 0.3 (Coakes, 2011). Field (2015) added that the minimum loading value should reflect the expected value of significant factors at a given sample size. Accordingly, for a sample size of 100, the factor loading greater than 0.512 is considered significant. Indeed, suppressing the items with a loading value below 0.4 is substantial at the sample size of 100 (Field, 2015). In this study, the

criteria suppress small coefficient value loadings below 0.4 to reduce the data redundancy and make the results more understandable.

Furthermore, the selection of several components (latent factors) is based on eigenvalues and the cumulative variance explained by factors. All factors with eigenvalues greater than one are selected and should explain at least 50% of the cumulative variance (Field, 2015; Coakes, 2011). The PCA extracted four latent factors (components) with eigenvalues greater than 1, explaining about 61.87% of the total variance (Table 4). The results show that all items loading is above 0.4 in each factor. Besides, any variable with significant loading in more than one factor is a redundant (not pure) variable (Coakes, 2011), and therefore rejected from the analysis.

Next, the four latent factors (components) are named based on the objective items loaded were intended to measure. Prior studies assessed financial inclusion in welfare, satisfaction, usage, uptake, and addressability (Mindra and Moya, 2017, Bongomin *et al.* 2018, Ali *et al.*, 2019). Accordingly, the measurement scale is designed to capture respondents' responses about Islamic financial services' relevancy, accessibility, usage, satisfaction, and welfare. Based on the loading values of the items (Table 4), Factor 1 measures the relevancy (quality) of Islamic financial services; Factor 2 measures the accessibility of Islamic financial services; Factor 3 measures the usage of Islamic financial services; and Factor 4 measures the welfare/satisfaction of Islamic financial services. Subsequently, the factors (components) are named in the following ways: Factor 1= relevance (REL), Factor 2 = access (ACC), Factor 3= usage (USA), Factor 4 = satisfaction (SAT). From the Rotated Component Matrix Table 4, item number 20 has a loading value below 0.5, hence considered not significant. Besides, items number 14, 15, and 19 have loaded in more than one factor, but they are significant in a single factor each; hence are considered a pure variable. However, special consideration is required for items number 14, 15, 19.

Table 4 Rotated Component Matrix

Item No.		Component (Factors)			
		1	2	3	4
		REL	ACC	USA	SAT
1	The products and services provided by Islamic financial institutions can improve my access to essential utilities/facilities.	.772			
2	Products/services offered by Islamic financial institutions are safe for me.	.749			
3	I highly intend to use Islamic financial services.	.745			
4	The products and services provided by Islamic financial institutions can improve my access to amenities.	.739			
5	Islamic financial institutions have convenient operating hours.	.732			
6	The available Islamic financial products/services comply with Islamic law.	.693			
7	I will think about using Islamic financial services.	.678			

8	The products and services offered by Islamic financial institutions can improve my nutrition/health.	.660			
9	I am aware of the Islamic financial products and services available in Zanzibar.	.614			
10	The nearest Islamic bank is less than 5 Kilometre from my home.		.782		
11	The nearest Islamic microfinance institution is less than 5 Kilometre from my home.		.771		
12	The nearest institution dealing with <i>zakat/sadaqat/waqf</i> services is less than 5 Kilometre from my home.		.692		
13	The Islamic financial Institutions are widely distributed in Zanzibar.		.671		
14	It is easy to access the service offered by Islamic financial institutions due to the availability of online facilities.	.436	.538		
15	The nearest Islamic Insurance institution is less than 5 Kilometre from my home.		.504	.444	.414
16	I have used Islamic financial products and services for financing/investment.			.855	
17	I have used Islamic financial products and services for insurance/protection against financial risk.			.807	
18	I have used Islamic financial products and services for saving/payments/remittances.			.784	
19	I receive prompt information regarding my transactions from Islamic financial institutions.			.521	.507
20	I live within less than 1 kilometre from Islamic financial institution's service centre/facilities such as an ATM that I can easily access my account.		.413	.417	
21	I can afford the initial fee charged for opening an account by an Islamic financial institution.				.787
22	The loan products and services provided by Islamic financial institutions suit my needs.				.694
23	The terms and conditions of accessing Islamic financial services are supportive to customers/members.				.619
Extraction Sums of Squared Loadings:					
	% of Variance	33.840	14.837	7.705	5.495
	Cumulative %	33.840	48.676	56.381	61.876
Rotation Sums of Squared Loadings:					
	% of Variance	22.880	14.532	13.883	10.582
	Cumulative %	22.880	37.412	51.294	61.876

#### 4. Proposed measurement items based on the PCA item loadings.

From the PCA Rotated Component Matrix (Table 4), the contentious items number 15, 19, and 20 were removed from analysis in order to have the most relevant measurement items in the model. After removing items 15, 19 and 20, the PCA result is presented in "Table 5: Rotated Component Matrix for selected items". From Table 5, all items loaded significantly in respective factors.

Table 5 Rotated Component Matrix for selected items

	Component (Factor)			
	1	2	3	4
	REL	ACC	USA	SAT
The products and services provided by Islamic financial institutions can improve my access to basic utilities/facilities	.793			
The products and services provided by Islamic financial institutions can improve my access to amenities	.748			
I highly intend to use Islamic financial services.	.732			
Products/services offered by Islamic financial institutions are safe for me	.719			
Islamic financial institutions have convenient operating hours	.694			
The products and services offered by Islamic financial institutions can improve my nutrition/health	.688			
I will think about using Islamic financial services.	.675			
The available Islamic financial products/services comply with Islamic law.	.649			.400
I am aware of the Islamic financial products and services that are available in Zanzibar.	.535			
The nearest Islamic bank is less than 5 Kilometre from my home.		.797		
The nearest Islamic microfinance institution is less than 5 Kilometre from my home.		.763		
The Islamic financial Institutions are widely distributed in Zanzibar.		.712		
The nearest institution dealing with zakat, <i>sadaqat/ waqf</i> services is less than 5 Kilometre from my home.		.702		
It is easy to access the service offered by Islamic financial institutions due to the availability of online facilities.		.601		
I have used Islamic financial products and services for financing/investment.			.852	
I have used Islamic financial products and services for insurance/protection against financial risk.			.821	
I have used Islamic financial products and services for saving/payments/remittances.			.776	
I can afford the initial fee charged for opening an account by an Islamic financial institution.				.811
The terms and conditions of accessing Islamic financial services are supportive to customers/ members.				.682

The loan products and services provided by Islamic financial institutions suit my needs.				.644
Extraction Sums of Squared Loadings:				
% of Variance	36.037	13.123	8.469	5.843
Cumulative %	36.037	49.159	57.628	63.471
Rotation Sums of Squared Loadings:				
% of Variance	23.751	16.149	12.923	10.648
Cumulative %	23.751	39.900	52.823	63.471

### 5. Reliability analysis

The interim constancy reliability test is performed to measure the internal consistency of the responses to the items in the measurement instruments. Cronbach's Alpha is a famous test for the internal consistency of a measure in multipoint scales. The Cronbach's Alpha value ranges from 0 to 1; the higher the value coefficient of (close to 1), the better (Sekaran and Bougie, 2013). A higher coefficient of Cronbach's Alpha indicates the consistency in measuring the constructs in a measure (Sekaran and Bougie, 2013; Field, 2015). Accordingly, this study uses Cronbach's Alpha to assess the interim reliability consistency of the items proposed to measure financial inclusion of Islamic finance. The reliability statistic (Cronbach's Alpha) is 0.896, and the standardized value is 0.901 (Table 6). Hence, it is concluded that the 20 items proposed by this study to measure the financial inclusion of Islamic finance are statistically suitable.

Table 6: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.896	.901	20

Table 7 provides the increase in the value of Cronbach's if any of the items were deleted from the model. Indeed, Table 7 proves that any deletion of proposed measurement items cannot significantly increase the reliability of the measure.

Table 7 Cronbach's Alpha if Item Deleted

S/N	Items	Cronbach's Alpha
1	The nearest institution dealing with <i>zakat/sadaqat/waqf</i> services is less than 5 Kilometre from my home.	.891
2	The nearest Islamic bank is less than 5 Kilometre from my home.	.891
3	The nearest Islamic microfinance institution is less than 5 Kilometre from my home.	.889
4	The nearest institution dealing with <i>zakat/sadaqat/waqf</i> services is less than 5 Kilometre from my home.	.891
5	It is easy to access the service offered by Islamic financial institutions due to the availability of online facilities	.890

6	The terms and conditions of accessing Islamic financial services are supportive to customers/ members.	.889
7	Products/services offered by Islamic financial institutions are safe	.890
8	I can afford the initial fee charged for opening an account by an Islamic financial institution.	.896
9	Islamic financial institutions have convenient operating hours	.888
10	The available Islamic financial products/services comply with Islamic law.	.890
11	I am aware of the Islamic financial products and services that are available in Zanzibar.	.889
12	I have used Islamic financial products and services for saving/payments/remittances.	.895
13	I have used Islamic financial products and services for financing/investment.	.897
14	I have used Islamic financial products and services for saving/payments/remittances.	.898
15	I highly intend to use Islamic financial services.	.890
16	I will think about using Islamic financial services.	.892
17	The products and services provided by Islamic financial institutions can improve my access to essential utilities/facilities	.889
18	The products and services provided by Islamic financial institutions can improve my access to amenities	.890
19	The products and services offered by Islamic financial institutions can improve my nutrition/health	.890
20	The loan products and services provided by Islamic financial institutions suit my needs.	.893

The PCA results provide the basis for constructing a measurement scale. Therefore, this study used PCA to identify the structure of measurement constructs for the financial inclusion of Islamic finance. The study involved 129 randomly selected residents in Zanzibar. The respondents' responses were collected using self-administered questionnaires. Initially, the financial inclusion of Islamic finance was measured using 23 items. Based on PCA, 20 items were found significant to measure the financial inclusion of Islamic finance. The 20 items loaded significantly into four components (factors), i.e., the relevancy, accessibility, usage, and satisfaction. Accordingly, the financial inclusion of Islamic finance can be assessed by collecting people's opinions about the relevancy of Islamic financial services, accessibility of Islamic financial services; usage of Islamic financial services; and satisfaction in Islamic financial services.

The findings of this study are supported by prior studies. Mindra and Moya (2017) measured financial inclusion in Uganda using seven items; i.e., 3 items to measure people responses on the accessibility of financial services; 2 items to measure people responses on the usage of financial services; and two items to measure people responses on the quality of financial services. Similarly, Bongomin *et al.* (2018) developed a 48 items questionnaire to assess financial inclusion in Uganda, focusing on the poor household responses on the accessibility, quality (relevance), usage, and welfare of financial services. In another study,



Bongomin and Ntayi (2019) developed 19 items to measure the financial inclusion of mobile money in Uganda, focusing on the accessibility, relevancy, quality, and welfare of mobile money services. Furthermore, Ali *et al.* (2019) proposed four dimensions (accessibility, availability, relevancy, and usage) to develop Indonesia's Islamic financial inclusion index. Henceforth, the financial inclusion of Islamic finance is assessed using four factors with a total of 20 measurement items, as shown in Table 5. Accordingly, the financial inclusion of Islamic finance is determined significantly by the accessibility, relevancy (quality), usage, and satisfaction of Islamic financial services (banks, insurance; institutions for the management of *Zakat*, *Waqf*, and *Sadaqat* (Mirakhor and Iqbal, 2012).

Furthermore, the Likert scale of 5 points is used in most prior studies and this study. For operational purposes, the study's finding is valuable and in line with Tanzania's NFIF (2018-2022) and the Findex survey (2017). Both NFIF and Findex surveys have focused on the accessibility, usage, quality, and satisfaction to assess the financial inclusion of the country.

a. Proposed Measurement items

The measurement instrument for Islamic financial inclusion comprises of 20 variables (items): 9 items measure people's responses on the relevancy (quality) of Islamic financial services; 5 items measure the people's responses on the accessibility of Islamic financial services; 3 items measure the people's responses on usage Islamic financial services, and three items measure the people's responses on the satisfaction of Islamic financial services.

b. Relevancy (quality) of Islamic financial services

(Cronbach's Alpha: Unstandardized .898, Standardised.901, No. of items 9)

- 1) Products/services offered by Islamic financial institutions are safe
- 2) Islamic financial institutions have convenient operating hours
- 3) The products and services offered by Islamic financial institutions can improve my nutrition/health
- 4) The available Islamic financial products/services comply with Islamic law.
- 5) I am aware of the Islamic financial products and services available in .....(Put a Place).
- 6) The products and services provided by Islamic financial institutions can improve my access to essential utilities/facilities.
- 7) The products and services provided by Islamic financial institutions can improve my access to amenities.
- 8) I highly intend to use Islamic financial services.
- 9) I will think about using Islamic financial services.

c. Accessibility of Islamic Financial Services

(Cronbach's Alpha: Unstandardized .829, Standardised.828, No. of items 5)

- 1) The nearest Islamic bank is less than 5 Kilometre from my home.
- 2) The nearest Islamic microfinance institution is less than 5 Kilometre from my home.
- 3) The Islamic financial Institutions are widely distributed in ..... (Put a Place).

- 4) The nearest institution dealing with *Zakat/Sadaqat/Waqf* services is less than 5 Kilometre from my home.
- 5) It is easy to access the service offered by Islamic financial institutions due to the availability of online facilities.
- d. Usage of Islamic financial services
  - 1) I have used Islamic financial products and services for financing/investment.
  - 2) I have used Islamic financial products and services for insurance/protection against financial risk.
  - 3) I have used Islamic financial products and services for saving/payments/remittances.
- e. Satisfaction of Islamic financial services  
(Cronbach's Alpha: Unstandardized .70, Standardised .70, No. of items 3)
  - 1) I can afford the initial fee charged for opening an account by an Islamic financial institution.
  - 2) The terms and conditions of accessing Islamic financial services are supportive to customers.
  - 3) The loan products and services provided by Islamic financial institutions suit my needs.

## E. Conclusion

Despite various studies conducted to propose the measurement tool for financial inclusion, the aspect of Islamic finance has not been captured. By using PCA, this study provides a comprehensive measurement tool to assess the financial inclusion of Islamic finance. The study provides the basis for other researchers intending to assess the inclusiveness of Islamic financial systems.

The impact of a financial system can be comprehensively assessed from the people to which the products or services are offered. Relying on the data from banks or other financial institutions can mislead the reality about the effect of the system on the community. Alternatively, the contribution of Islamic financial institutions to financial inclusion can be assessed by collecting responses from the targeted users of the services/products. Indeed, given the unique feature of Islamic financial systems, this kind of financial inclusion measurement tool is crucial.

Due to the lack of a universal tool to measure financial inclusion, the proposed tool in this study can be helpful for further studies. The study proposed 20 items that can be used to individuals' responses on the accessibility, relevancy (quality), usage, satisfaction, and welfare benefits of Islamic finance. In assessing the financial inclusion of Islamic finance, identifying people's profiles and opinions is crucial. The proposed measurement items will help capture responses to financial inclusion in the Islamic perspective using four dimensions: accessibility, relevancy, usage, and satisfaction.

Like any other academic study, this study is subject to some limitations. This study is limited to Islamic financial services in Zanzibar, where the development of Islamic finance is still at an infant stage. In addition, the study is limited to exploratory analysis; hence the

significance of the proposed measurement model is still a subject to be explored. In addition, studies assessing various determinants of the financial inclusion of Islamic finance are essential.

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