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Article

Development of Integrated Islamic Finance-Based Index of Financial Inclusion Using Zakat and Cash Waqf: A Preliminary Study in Malaysia

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ABSTRACT - Financial inclusion is a priority agenda in many countries. While the importance of financial inclusion index is widely recognized, the literature lacks a constructive discussion on its measurement in the light of Islamic finance since it is believed that only by the incorporation of the Shariah-based instruments, the level of access to finance can be improved. The study aims to develop a methodology for the computation of an integrated Islamic finance-based index of financial inclusion in Malaysia. Based on the current measurement of financial inclusion index (IFI) in Malaysia, this study employs a self-administered questionnaire and secondary data from Jabatan Waqaf, Zakat dan Haji (JAWHAR) and Yayasan Waqaf Malaysia (YWM), to measure the integrated Islamic finance based financial inclusion index for year 2011 and 2015. *Zakat* and cash *waqf* indicators are added in the index computation to represent Islamic finance components. Depending on the value of the index, a country is classified into four categories; high, above average, moderate or low integrated Islamic finance-based of financial inclusion. It is found that the level of financial inclusion using Islamic finance indicator in Malaysia is above average. The overall index level is increased from 0.49 in year 2011 to 0.55 in year 2015. Interestingly, most of the level of *zakat* and cash *waqf* indicator indexes are low which indicate that these channels require specific attention to tackle financial inclusion in Malaysia. It is hoped that the findings would be useful for the development of financial inclusion index using Islamic finance approach and monitoring the impact of *zakat* and *waqf* to the society.

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INTRODUCTION

The focus of financial inclusion is not only to enhance a country's economic growth but also to eradicate poverty and reduce the gap between the rich and the poor within a country towards sustainable development (Dzulkepli & Barom, 2021). According to the Malaysian Financial Sector Blueprint (FSBP) 2011-2020, pursuing the financial inclusion agenda means all members of society have the opportunity to participate in the formal financial system. This will continue to be a crucial component of Malaysia's inclusive growth strategy. Access to finance will enable all citizens, including the low-income and rural residents, to have the opportunity to undertake financial transactions, generate income, accumulate assets and protect themselves financially against

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unexpected adverse events, thus allowing them to benefit from economic progress. This will, in turn, contribute to balanced and sustainable economic growth and development (Bank Negara Malaysia, 2011). These become the underlying vision of financial inclusion framework in Malaysia which is to create 'an inclusive financial system that best serves all members of society, including the underserved, to have access to and usage of quality, affordable essential financial services to satisfy their needs towards shared prosperity' (Bank Negara Malaysia, 2015).

As has been suggested by Iqbal and Mirakhor (2013), conventional finance is not entirely successful in addressing this issue as the existing conventional financial instruments do not really reach the poor. Although there is a microfinance mechanism that supposedly caters such group, its effectiveness is often limited by the profit motive and the refusal of the microfinance provider to take high risks (Elrahman & Saaid (2014).

As the effect of this, those who are extremely poor are usually left behind. However, to achieve the real objective of financial inclusion, not only the role be played by the conventional financial services providers, but also by the Islamic financial system through its various instruments which deemed to be more comprehensive. The concept of financial inclusion is not something new to Islamic finance since Islam itself emphasizes inclusion, equality and justice (Iqbal & Mirakhor, 2013). Therefore, by integrating the Shariah-based instruments, the level of access to finance could be improved. In other words, Islamic financial system could provide a better avenue to drive financial inclusion (Mohieldin, 2012).

Except for Ben Naceur et al. (2015) and Zulkhibri (2016), it is worth noting that although the discussion on the role of Islamic finance in financial inclusion is largely mentioned in the previous studies, those discussions are rather normative than positive. These studies are very much lacking in terms of empirical evidence to support their arguments. In this regard, it could be suggested that the evidence on how Islamic finance deals with financial inclusion remains unclear. The little empirical research on the impact of Islamic finance towards access to finance may be partially explained by the issue of financial inclusion measurement. Empirically examining the link between the two is particularly challenging given the fact that a uniform measure of financial inclusion using the Islamic finance approach does not exist. The present study is timely in providing a clear picture of the need for Islamic finance based financial inclusion measurement through wealth distribution pillar under Islamic social finance tools i.e., *zakat* and *waqf*, and further proposing the development of the index. The next section provides a review of literature on the subject matters. The methodology as well as results and discussion are presented in the following sections, respectively. The last section concludes this study.

LITERATURE REVIEW

Financial inclusion: Malaysian context

Financial inclusion is a complex scenario and classic global phenomenon. Many studies have been sponsored and published worldwide to examine financial inclusivity in different areas. Example of such studies by countries include Ghana (Koomson & Danquah, 2021), Africa (Kebede et.al., 2021), Bangladesh (Aziz & Naima, 2021), Pakistan (Laos (Morgan & Long, 2020), Ramzan et.al., 2021), Indonesia (Erlando, et.al., 2020), Burkina Faso (N'dri & Kakinata, 2020), US (Jacobson, 1995; Hogarth & O'Donnell, 1999; Aizcorbe et al., 2003), United Kingdom (Budd & Campbell, 1998; Kempson et al., 2000; Hayton, 2001; Devlin, 2005), Scandinavia (Hohnen, 2007), Canada (J Buckland & Simpson, 2008) and Australia (Chant Link and Associates, 2004; Howell & Wilson, 2005)]. It is very much synonym with the lack of access to formal finance.

Malaysia particularly has taken this matter seriously as financial inclusion acts as an engine to contribute to balanced and sustainable economic growth and development. In 2009, in transforming Malaysia into a high-income economy, supported by sustainable growth, the New Economic Model (NEM) was introduced by the Malaysian Government. Inclusiveness, alongside high income and sustainability is one of the important desired outcomes of this vision. The participation of the bottom 40% of the households based on income stratification in the overall economic and financial sector growth is seen as key in achieving economic prosperity as well as sustaining social cohesion (Bank Negara Malaysia, 2016).

The prime function of Bank Negara Malaysia in promoting a sound, progressive and inclusive financial sector is expressed in the Central Bank of Malaysia Act 2009 to further reinforced Bank Negara Malaysia's strategic focus on driving financial inclusion policies. In fulfilling the financial inclusion mandate, a holistic framework has been articulated within BNM's Financial Sector Blueprint (FSBP) 2011-2020 to improve the overall well-being of communities on the aspects of convenient accessibility, high take-up, responsible usage and high satisfaction of financial services as shown in Figure 1.

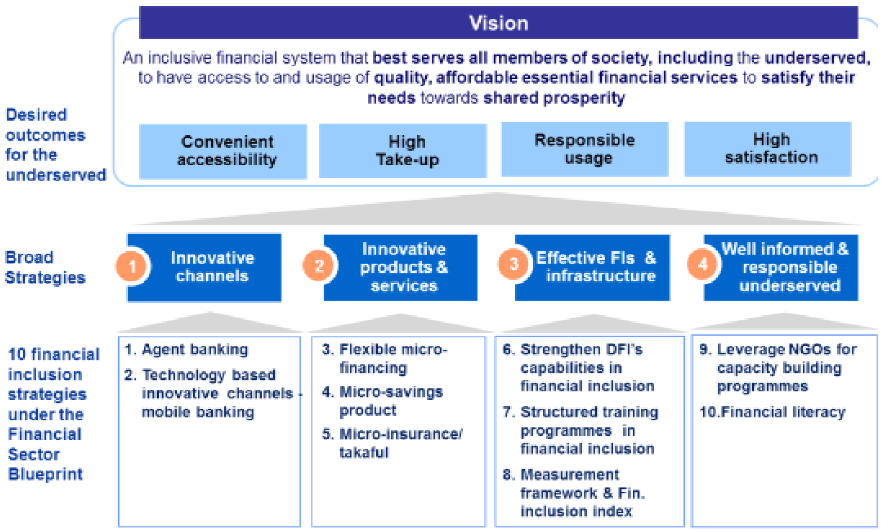

Figure 1: Holistic Financial Inclusion Framework for 2011-2020

The vision of the financial inclusion framework is to create an inclusive financial system that best serves all members of society, particularly the underserved, to have access to and usage of quality, affordable essential financial services to satisfy their needs towards greater shared prosperity. The attainments of the vision are measured through the desired outcomes for customers, namely convenient accessibility, high take-up, responsible usage and high satisfaction of financial services.

The FSBP has acknowledged ten main action plans based on the strategic outcomes via innovative channels and products and services, empowerment of the disfavoured group with financial knowledge and strengthening the financial institutions and infrastructure. The implementation of these action plans is currently being carried out and are at various stages of completion.

At the international level, BNM has become a strong advocate for the financial inclusiveness agenda. This can be proved by the meaningful contributions and active participation in the Alliance for Financial Inclusion (AFI) and ASEAN Working Committee on Financial

Inclusion (WC-FINC). On top of that, BNM has collaborated with the Irving Fisher Committee on Central Bank Statistics, AFI, Organisation for Economic Co-operation and Development (OECD) and World Bank for capacity building programmes, organised for global policymakers on financial inclusion. BNM also has partnered with Asian Banking School in developing leadership and technical training to micro finance practitioners in the region.

With regard to the measurement of financial inclusion, BNM has developed an index of financial inclusion (IFI) to measure the effectiveness of formal financial institutions in delivering financial products and services to all members of society. This is an essential mechanism to trace down the progress of initiatives and estimate the impact of policies to have greater access to the financial sector. A nationwide IFI also provides a comprehensive view of the development of an inclusive financial system, further enhancing the transformation efforts made by the government (Abd Rahman, 2013).

The index takes into account the experiences and methodologies developed for the computation of well-known development indexes such as the human development index, the multi-dimensional poverty index and the gender inequality index and work undertaken by the Alliance for Financial Inclusion (AFI), with several new elements. Using the 'core set' of indicators formulated by the AFI financial inclusion data working group (FIDWG), BNM constructed the financial inclusion key performance indicators by defining four dimensions of financial inclusion for Malaysia (see Table 1). The index rates the level of financial inclusion, measuring the extent to which the general population has access to financial services by examining access and usage of formal financial intermediaries as well as the quality of financial services. The strengths and weaknesses of each dimension could also be analysed through the sub-indexes underlying the overall IFI. As a result, they serve as a valuable guide for policy-makers and other stakeholders to identify the performance of the respective business environments and prioritise areas that need specific consideration (Abd Rahman, 2013).

Table 1: Key performance indicators for measurement of Index of Financial Inclusion (IFI) in Malaysia

Dimension	**Key Performance Indicators**
Convenient Accessibility	% of sub-district with at least 2000 population with at least 1 access point % of population living in sub-district with at least one access point
Take-Up Rate	% of adult population with deposit accounts % of adult population with financing accounts % of adult population with life insurance/takaful policies
Responsible Usage	% of customers with active deposits % of customers with performing financing accounts
Satisfaction Level	% of customers who are satisfied − Overall financial services

Depending on the values of IFI, the results are categorized into the four following categories:

i. $0.75 < IFI \leq 1$: high financial inclusion
ii. $0.5 \leq IFI < 0.75$: above average financial inclusion
iii. $0.25 \leq IFI < 0.5$: moderate financial inclusion
iv. $0 \leq IFI < 0.25$: low financial inclusion

Based on a study done in 2011 by Abd Rahman (2013), the score of financial inclusion for the general population in Malaysia as measured by the IFI is high, i.e., at 0.77. However, the sub-index of access points is lower as compared to the other dimension. Whereas the level of financial inclusion for the low-income group is reported to have a lower score for IFI i.e., 0.68 compared with the general population in Malaysia. In this scenario, low income is defined as the segment of population that earns less than RM1,000 ($330) per month. Take-up rate requires specific attention to tackle financial inclusion for this underserved group. In another study, the IFI score for the general population in Malaysia has improved significantly to 0.90 in 2015 from 0.77 in 2011 (Martinez, 2017). Among the factors contributing to these improvements are increased accessibility to financial access points across the country, more responsible usage of products and higher levels of satisfaction among financial consumers. However, there are still gaps in the utilisation of financial products and services, especially among low-income households (Martinez, 2017).

Nevertheless, as far as the role of Islamic finance towards financial inclusion is concerned, the current measurement framework of IFI is lacking in terms of Islamic finance dimensions which could provide better understanding and tracking purposes on the subject matter. With this regard, computation of financial inclusion index using Islamic finance dimensions is warranted.

Islamic Finance Promotes Financial Inclusion

As reported by World Bank (2018), close to one-third of adults – 1.7 billion – are still unbanked. About half of unbanked people include women from poor households in rural areas or out of the workforce. The economic development gains substantial benefits from the rural population with the support of inclusive agenda (Johnston 2005; Stein 2010; Le et al., 2019; Hasan et al., 2020). Hence, financial access could drive the considerable growth of the financial system as a whole (Hasan et al., 2020; Rashidin et al., 2020). Additionally, access to finance could also promote poverty reduction (Chao et al., 2021). However, it is worth noting that those underserved segment should get support from both formal and informal financial institutions (Helms 2006; Hussain et al., 2018; Zulkhibri 2016). Under Islamic finance specifically, those underprivileged segment has special avenues to support their needs to maintain basic sustenance as well as enhance their life using Islamic social finance tools (Biancone & Radwan 2019; Kuanova et al., 2021: Shuaib & Sohail 2021).

Theoretically, the Islamic financial system plays an important role in promoting welfare in the society through its prohibition of *riba* (interest), speculation and gambling (Chapra, 1992). It places equal emphasis on the ethical, moral, social, and religious dimensions, to enhance equality and fairness for the good of the society as a whole. With the application of the work ethic, wealth distribution, social and economic justice and the role of the state, the Islamic financial system considers being more welfare-based financial system as compared to its counterpart. In this regard, it can be suggested that an Islamic-based financial system is theoretically better in promoting financial inclusion.

By embracing maqasid al-Shariah[1], Islamic finance must portray the essence and spirit of Shariah through its practices rather than focusing only on the legal aspects of its products (Ishak & Nasir, 2021). Islamic finance should, in principle, drive financial inclusion by removing religious barriers, fostering risk sharing, promoting social finance (World Bank, 2020), human empowerment, increased financial services and financial windows (Usman & Tasmin, 2016). The Findex database (World Bank, 2017) reports that; based on self-reported religious considerations, only 1.6 percent of all Malaysian adults are excluded from the formal financial system. On an absolute basis, this figure is remarkably low, and Malaysia ranks ninth on this criterion, putting it in the top quartile of the 42 OIC countries for which data is available. Given Malaysian society's multifaith structure, it is unclear whether all of these adults are Muslims. Even if they are not Muslims, research shows that many have religious concerns to the financial system (World Bank, 2020).

In the similar vein, Mohieldin et al. (2012) note that financial inclusion from the Islamic perspective can be tackled in two ways: first, inclusion through risk-sharing, and second, through the instruments of redistribution. Risk sharing is claimed to be the objective of Islamic finance (Mirakhor, 2010) and as an alternative to conventional financing which targets both financial and social inclusion simultaneously. It involves the sharing-based contracts, where both lender and borrower are entitled to the realized profit or liable for the loss realized according to their shares specified in the contract (Erbas & Mirakhor, 2010).

However, Hasan (2015) argues that risk sharing is not basic to Islam. Islam approves profit-and-loss sharing; sharing of risk is a consequence of that, not its cause. On a different note, Rosly (2012) states that risk-sharing and risk-taking are basically two sides of the same coin; the former encompasses the financing of capital while the latter involves business operations that create cash flows. This has been the true meaning of *al-bay'* that the Quran intends to convey as opposed to *riba*. When economies under financial crisis are looking for an alternative to interest-based debt financing, embracing Islamic risk behaviour in both forms (i.e., risk-taking and sharing) is the pleasing alternative. This is very much consistent with what has been outlined by Halim (2001) who sheds light on the type of contracts involved in Islamic finance. The term al-bay' comprises of both risk-sharing contracts (i.e., *al-mudharabah* and *al-musharakah*) as well as risk-taking contracts [i.e., *salam* sale (*bay' al-salam*), sale on order (*bay' al-istisna*), and leasing (*al-ijarah*)]. Thus, by practicing the true essence of risk sharing and risk-taking modes of commerce, it could promote better financial inclusiveness as the system emphasizes the widest distribution of risk and reward through the whole society (Kamali, 2002).

On top of that, the concept of social finance through redistribution of wealth is based on the concept of a balanced society in Islam that tries to avoid the occurrence of extreme wealth and poverty. Social finance tools such as *zakat, waqf*, Shariah compliant crowd funding, and microfinance can be used to find creative means of financing (Biancone & Radwan, 2019). These Islamic social finance tools are linked to philanthropy, but they take on different forms and concepts. *Zakat* and *waqf* particularly are powerful instruments which are forms of wealth transfer, and they reach the needy, parallel with the Islamic principles of property rights for all.

Zakat, as one of the pillars in Islam, is an ordained rule for wealth redistribution that targets the needy, in which the results can improve their poverty line. It is not charity but an obligation for Muslims. It can be defined as a form of flat-rate social security tax earmarked for redistribution of wealth (Erbas & Mirakhor, 2010). Empirically speaking, the evidence on the impact of access to finance via *zakat* so far is substantial. Results revealed that effective *zakat* collection and

[1] *Maqaṣid* (singular: *maqṣid*) refers to the goals and purposes of the *Shariah* (i.e., the Islamic Law). For details, refer Kamali (2011).

distribution reduce poverty incidence, reduce the extent of poverty, lessen the severity of poverty, reduce income inequalities (Mohd Ali et al., 2015; Bashir, 2018), help both the poor and needy to meet their consumption of basic needs (Abdullah, 2018) as well as could improve educational equity among urban poor Muslim students (Mohd Radzi & Kenayathulla, 2017).

Another instrument, the *waqf*, also seeks to mobilize a large number of financial resource in a way which the contributors endow the stream of income accruing to a property for a charitable purpose in perpetuity (Iqbal & Mirakhor, 2013). Access to this instrument is recognized to be a powerful tool for poverty alleviation (Abdul Rahman et al., 2016; Shaikh et al., 2017). With regard to prior discussion and analysis concerning the impact of *waqf*, among others, Mikail et al., 2017) note that apart from *zakat* and micro-takaful, *waqf* provides social securities and socio-economic support to low-income households in societies. Specifically, the strength of *waqf* in the economy has indeed impacted the development of the education system (Mahamood & Ab Rahman, 2015; Mujani et al., 2017; Huq & Khan, 2017) and have great potential to help the poor and needy in meeting their housing needs (Rashid et al., 2018) and access to finance for enterprises (Sahiq et al., 2016).

Therefore, financial inclusion should go beyond conventional, by considering the potential of the Islamic financial instruments in the mission of poverty alleviation and community development. Especially for Muslim countries, where its redistributive instruments are already institutionalized, then the ability of these tools to enhance the access to finance should be considered to create an inclusive financial system. For example, according to a report by Malaysia International Islamic Finance Centre (2015), the collection of *zakat* and various Shariah-based microfinance programs offered in Malaysia, Indonesia and Bangladesh has managed to raise the living standards of low-income groups and increased the number of entrepreneurs in these countries, as they helped to increase the involvement of low-income groups in the financial sector. On top of that, it is suggested that *awqaf, qard-al-hassan, sadaqa, and zakah*, can play a role in bringing more than 40 million people of Muslim countries, who are financially excluded for religious reasons, into the formal financial system (Zulkhibri, 2016).

Financial Inclusion Index based on Islamic Finance: Empirical Literature

As far as measurement of financial inclusion is concerned, despite a growing body of literature on financial access, there is no single assessment of financial inclusion that can be applied across countries. This constraint stems from a lack of data on the use of basic financial services by people and businesses (Abd Rahman, 2017; Claessens, 2006), as well as ongoing changes to give a more comprehensive measure of financial inclusion. This shows that the characteristics and indicators of financial inclusion that may be used to describe and track the incidence of financial inclusion across time are currently lacking, let alone the indicators to trace financial inclusion based on Islamic finance tools.

The main weakness of the conventional perspective of financial inclusion measurement is its failure to acknowledge the concept of social finance through wealth redistribution as what had been recommended in Islam. There are also issues in relation to the microfinance industry which has restricted its effectiveness such as the issue of high-interest rates, lack of appropriate product design, diversion of the fund and lacking skills of the recipients (Iqbal & Mirakhor, 2013). These issues are coupled with the issue of voluntary self-exclusion by capable Muslims to engage with the financial system based on religious grounds (Ahmed, 2013). As a result, access to the financial system is not comprehensive and importantly, it does not reach those who are extremely poor. These are the issues ignored in discussing the country's financial inclusion and perhaps the reason that the financial inclusion index is low in most emerging markets that are predominantly with Muslim population (Demirgüç-Kunt et al., 2008).

The present finance research on identifying impediments to financial inclusion focuses mostly on the banking sector's credit/financing and savings/deposits services. As a result, most of the discussions focus on how to quantify financial inclusion using banking data (e.g., Beck et al., 2007; Honohan, 2008; Sarma, 2008; Arora, 2010; Chakravarty & Pal, 2010; Gupte, Venkataramani & Gupta, 2012; Bhalli & Raghavan, 2021; Tram, et al., 2021). By analyzing the key financial access dimensions, some of the authors also attempt to develop an index to measure the level of financial inclusion. However, it can be argued that many of the attempts are very much limited to credit/financing and savings/deposits services data, disregarding potential indicators from other financial instruments such as insurance and microinsurance. With respect to Islamic finance, there are other financial tools accessible to public and targeted group as discussed in previous section which yet to be included in the measurement of financial inclusion.

Despite the fact that the Islamic financial system has developed over the last 40 years, there are scanty studies on the impact of Islamic finance on financial inclusion (Abdu et al., 2018) until recently [see for example, Mustafa et al. (2018), Ali and Devi (2019); Khmous and Besim (2020) and Kamalu and Wan Ibrahim (2021)]. It is worth noting that most of those studies only examine the relationship between Islamic finance and financial inclusion using Islamic banking data. Such indicators, while used individually, leads to limited picture on the financial inclusiveness and lack of understanding to capture the extent of financial inclusion in a particular country (Sarma, 2008).

Specifically, studies on the index of financial inclusion based on Islamic finance dimensions are very much lacking. Although the importance of Islamic finance-based financial inclusion is widely recognised, the literature on this subject lacks a comprehensive measure that can be used to measure the extent of financial inclusion across economies using Islamic finance dimension. Except for Abu Seman and Mohd Ariffin (2017) which attempt to develop Islamic finance-based index of financial inclusion by suggesting four different indicators (namely use/access to Islamic banking products/services, use/access to Islamic microfinance products/services, use/access to *zakat* and use/access to *waqf*), recent studies by Ali and Aziz (2019) and Akhtar et al. (2020) use only Islamic banking data to compute Islamic financial inclusion index. Thus, a comprehensive and integrative measure of Islamic financial inclusion index is warranted.

METHODOLOGY

This section presents the initial construction of Integrated Islamic Finance-Based Index of Financial Inclusion (hereafter referred to as IIFIFI) in Malaysia. It starts by discussing the parameters and development of IIFIFI. Next, data collection is further explained.

Parameters

Some evidence mentions that the measurement of index needs to include as many dimensions as possible (see, for example Sarma, 2008; Kumar & Mishra, 2009; Arora, 2010; Sarma & Pais, 2011; Gupte et. al., 2012). As the benchmark of any of study, these dimensions have to be measurable and answerable. To fulfil this objective, indicators of each of the dimension are essential. The two parameters in the index computation, i.e., dimensions and indicators, are complementary to one another. For this initial study, the parameters adopted in IIFIFI follow the work contributed by Abd Rahman (2013, 2017) with integration of a new dimension (i.e., Islamic social finance) using four indicators (i.e., *zakat* and cash *waqf* collection as well as *zakat* and cash *waqf* distribution) as shown in Figure 2. The total five dimensions are used to compute IIFIFI. *Zakat* and cash *waqf* indicators are employed in this study due to the fact that there are many studies highlighting these tools in promoting financial inclusion [see, for example Mohd Ali et al. (2015), Abdul Rahman et al. (2016) Shaikh et al. (2017), Bashir (2018), Erbas and Mirakhor (2010), Biancone and Radwan (2019), World Bank (2020)], as discussed in previous section. Compared with the other dimensions, the Islamic social finance dimension is added to signify the unique purpose and target group of people giving and receiving *zakat* and cash *waqf*.

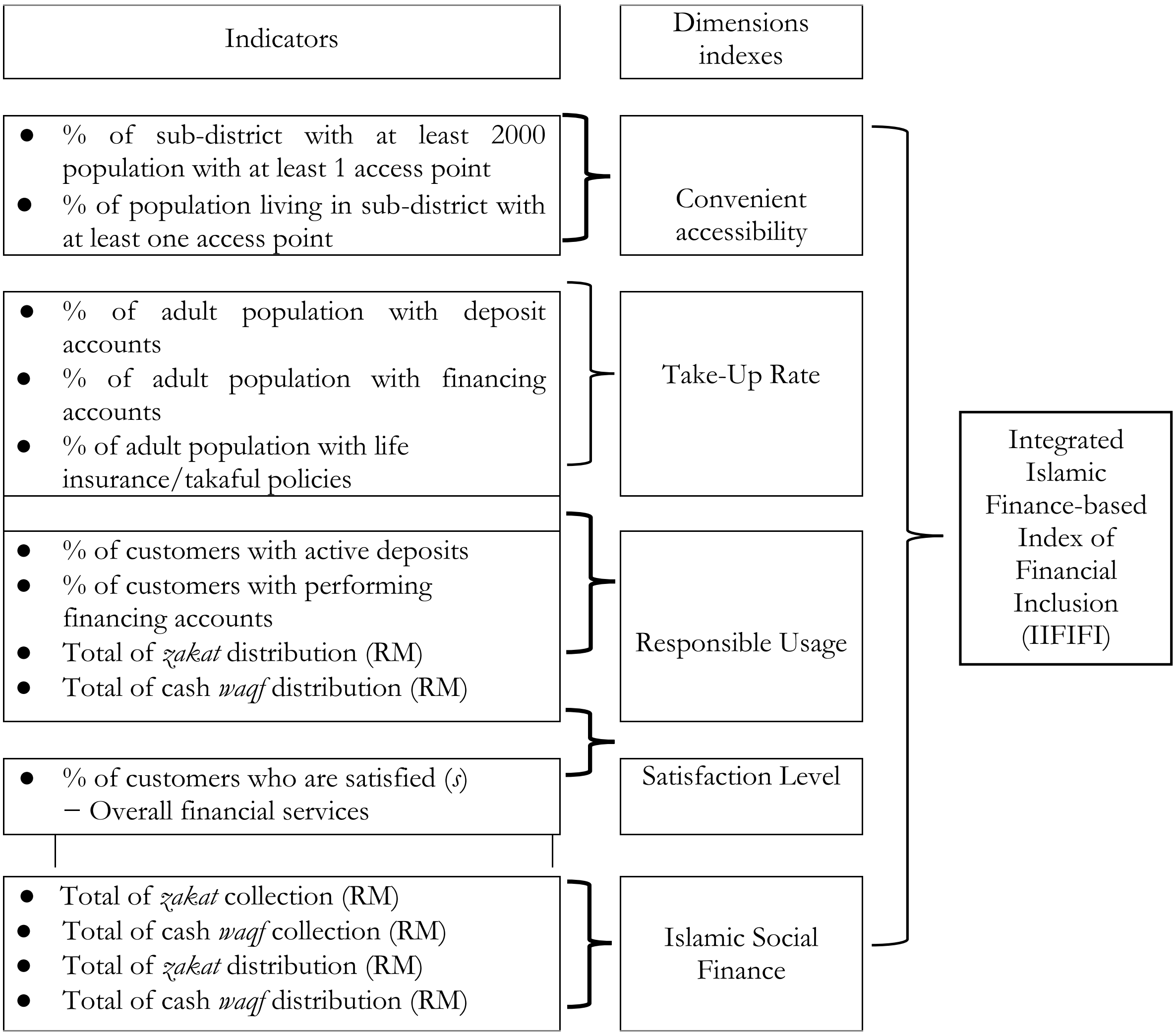

Figure 2: Dimensions and indicators used for the computation of integrated Islamic finance-based index of financial inclusion (IIFIFI)

Zakat and cash *waqf* collection represent the accessibility or outreach aspect of financial inclusiveness. In other words, the amount collection of *zakat* and cash *waqf* portrays the opportunity to gain financial access through these channels other than the other mainstream finance. With the amount of *zakat* collection, targeted recipients should benefit from this channel, while as for cash *waqf* collection, public as well as underserved group could be served through this stream.

With respect to the *zakat* and cash *waqf* distribution, these two indicators signify the usage aspect in computing the index. The amount of *zakat* and cash *waqf* distribution depicts the real usage of the instruments to serve the purpose of getting supports to be financially included.

The index measures the state of financial inclusion, indicating the extent to which the general population has access to financial services by examining access and usage of both formal financial intermediaries and Islamic finance institutions and, to certain extent, the quality of financial services. Specific strengths and shortcomings within each dimension can be observed through the sub-indexes that subtend the complete IIFIFI.

Construction of Integrated Islamic Finance-Based Index of Financial Inclusion in Malaysia

As previously stated, the study follows similar methodology and reasoning as adopted by Abd Rahman (2013, 2017) in measuring financial inclusion performance by combining indicators representing the identified dimensions into a composite index of integrated Islamic finance-based financial inclusion, IIFIFI. The methodology is originally introduced by Sarma (2008). For each dimension, *n* numbers of variables are included:

$$D_i = x_1, x_2, x_3 \ldots\ldots x_n \qquad (1)$$

where:
D_i = inclusion dimension,
X = variable, and
$_i$ = individual country.

In this study, D_i and X represent the four dimensions and twelve indicators shown in Figure 2 above, respectively, while *i* indicates Malaysia.

There are three steps in calculating the IIFIFI. Each step is presented as follows.

First Step

The IIFIFI is calculated by first computing sub-indices for each indicator by setting minimum and maximum values (frontiers or targets) for each. The distance to frontier approach, which defines frontier as perfect financial inclusion, is calculated from the current position of financial inclusion. For each variable, d_i is computed using the Linear Scaling Technique (LST) as presented in Eq. (2).

$$d_i = \frac{A_i - m_i}{M_i - m_i} \qquad (2)$$

where:
A_i = actual value of indicator $_i$,
m_i = minimum value of indicator $_i$, and
M_i = maximum value of indicator $_i$.

Second Step

These sub-indices are then weighted in accordance with importance and aggregated in order to transform these sub-indices of indicators into a dimension index, which is expressed as a value between 0 and 1. Since this is the initial effort in integrating Islamic finance elements in calculating Islamic financial inclusion index in Malaysia, the weightage for the existing dimensions by Abdul

Rahman (2013, 2017) is adopted without modification. Only the weightage for Islamic social finance indicators is added to the calculation.

A weight w_i such that $0 \leq w_i \leq 1$ is attached to the dimension *i*, indicating the relative importance of the dimension *i* in quantifying the financial inclusiveness. These sub-indices are then weighted based on the importance and aggregated in order to transform these sub-indices of indicators into a dimension index. According to Abdul Rahman (2017), the dimensions are equally weighted since there is no evidence to indicate that one dimension is more important than the other and there is also no unanimity made in the literature on which set of dimensions/categories is crucial to calculate financial inclusion. In terms of determining appropriate weights, as Sarma (2008, 2010) point out, the lack of sufficient data on critical indicators that fully identify the accessibility and usage dimensions leads less weight given to the dimensions in the index. With regards to accessibility of banking services, many countries including Malaysia, have moved towards internet banking, thus reducing the importance of access points/physical bank outlets (i.e., bank branches and ATMs). Some countries also offer banking services through telephones as well as the internet. Thus, using data only on access point can give an incomplete picture of the accessibility of banking services. Likewise, data on deposit and financing can only partly represent the usage as other services of the banking system, such as payments, transfers and remittances are not taken into account. Additionally, this study do not include other tools in Islamic social finance dimension for example Islamic microfinance and Islamic crowd funding. Thus, in the absence of such data, a complete characterization/weight of these dimensions is not possible.

As far as *zakat* and cash *waqf* are concerned, these two instruments have their own specific principles. *Zakat* is a commanded rule under Islamic teachings and part of the obligation of Muslims under the pillars in Islam, whereas *waqf* is a voluntary charitable of perpetual endowment (Erbas & Mirakhor, 2010; Iqbal & Mirakhor, 2013; Biancone & Radwan, 2019). It is clear that *zakat* is more emphasized in Islam but at the same time Islam encourages Muslims to help the needy through *waqf*. Therefore, for the purpose of this initial study, more weightage is given to *zakat* as compared to cash *waqf*. Table 2 below summarizes the suggested indicators for the computation of IIFIFI.

Table 2: Summary of Dimensions and Suggested Indicators for IIFIFI Computation

Dimension	Indicators	Weight	Equal Weighted Dimension
Convenient Accessibility	% of sub-district with at least 2000 population with at least 1 access point	0.5	0.20
	% of population living in sub-district with at least one access point	0.5	
Take-Up Rate	% of adult population with deposit accounts	0.5	0.20
	% of adult population with financing accounts	0.25	
	% of adult population with life insurance/takaful policies	0.25	
Responsible Usage	% of customers with active deposits	0.5	0.20
	% of customers with performing financing accounts	0.5	
Satisfaction Level	% of customers who are satisfied − Overall financial services	1.0	0.20
Islamic Social Finance	Total of *zakat* collection (RM)	0.30	0.20
	Total of *zakat* distribution (RM)	0.30	
	Total of cash *waqf* collection (RM)	0.20	
	Total of cash *waqf* distribution (RM)	0.20	

Third Step

Finally, the IIFIFI is the arithmetic mean of the five-dimension indices. Index ranges from 0 – 1, with 1 being perfect financial inclusion and 0 being total financial exclusion. Depending on the value of IIFIFI, the country is classified into four categories, namely:

i. 0.75 < IIFIFI ≤ 1 : high integrated Islamic finance-based of financial inclusion
ii. 0.5 ≤ IIFIFI <0.75 : above average integrated Islamic finance-based of financial inclusion
iii. 0.25 ≤ IIFIFI <0.5 : moderate integrated Islamic finance-based of financial inclusion
iv. 0 ≤ IIFIFI <0.25 : low integrated Islamic finance-based of financial inclusion

Data Collection

Preferably, one should take into consideration as many dimensions to arrive at a holistic view on the Islamic finance approach of financial inclusiveness across the country. Empirically examining the factors associated with financial inclusion is particularly challenging given uniform measure of financial inclusion across countries does not exist. Data constraint is the major problem in this issue (Claessens, 2006; Beck et al., 2009; Abd Rahman, 2013). Similarly, there is a major constraint on data availability on the Islamic finance dimensions for the index computation (Abu Seman et.

al., 2019). Currently, a single database on all the Islamic finance instruments is absent. Therefore, this study calibrates the indicators using data from two main sources as following:

i. Existing data of IFI computation by Abdul Rahman (2013, 2017)
ii. Data on Islamic social finance indicators (i.e., *zakat* and cash *waqf*) derived from archival data downloaded from the two important institutions' websites, namely Jabatan Waqaf, Zakat dan Haji (JAWHAR) and Yayasan Waqaf Malaysia (YWM).

The data collection involved year 2011 and 2017 as the basis of the IIFIFI calculation is derived from the study done by Abdul Rahman (2013, 2017) and there was no detail dataset available for the other years on the indicators used. As this is a preliminary study on the establishment of Islamic finance based financial inclusion index in Malaysia, the sample of IIFIFI index calculation utilizing the two years data is sufficient to gauge and compare the level of financial inclusion using Islamic social finance elements. This appears in line with the view that has been put forward by United Nations (2020) which states that reforms may take time to materialize. Therefore, analyzing the level of financial inclusion in 2011 and 2015 would provide a meaningful understanding on the progress of the government initiative after four years since the inception of Holistic Financial Inclusion Framework in 2011 under BNM's Financial Sector Blueprint (FSBP). Table 3 below provides a summary of description and source of each indicator for the computation of IIFIFI.

Table 3: Description of Data Collection for IIFIFI Computation

Dimension	Indicators	Source	Date
Convenient Accessibility	% of sub-district with at least 2000 population with at least 1 access point	Abdul Rahman (2013, 2017)	2011 and 2015
	% of population living in sub-district with at least one access point		2011 and 2015
Take-Up Rate	% of adult population with deposit accounts		2011 and 2015
	% of adult population with financing accounts		2011 and 2015
	% of adult population with life insurance/takaful policies		2011 and 2015
Responsible Usage	% of customers with active deposits		2011 and 2015
	% of customers with performing financing accounts		2011 and 2015
Satisfaction Level	% of customers who are satisfied − Overall financial services		2011 and 2015
Islamic Social Finance	Total of *zakat* collection (RM)	Jabatan Waqaf, Zakat dan Haji (JAWHAR) and Yayasan Waqaf Malaysia (YWM)	2011 and 2015
	Total of *zakat* distribution (RM)		2011 and 2015
	Total of cash *waqf* collection (RM)		2011 and 2015
	Total of cash *waqf* distribution (RM)		2011 and 2015

RESULTS

Table 4 presents the results of the IIFIFI computation. Using *zakat* and cash *waqf* indicators to represent Islamic social finance elements, it is found that the level of financial inclusion in Malaysia was above average in 2011 and improved to high level in 2017. The overall index level increased from 0.67 in year 2011 to 0.87 in year 2015. Remarkably, the level of Islamic social finance dimension index was the lowest as compared to the other four dimensions for both years of observations. Looking into each of the Islamic social finance indicator's index, it is generally shown that the level of inclusion variation through time is not largely noticeable for both *zakat* collection and distribution. This is in line with Alias (2013) who discovers that, on average, *zakat* collection only covers 20% of total possible *zakat* across the country. Similarly, only 3983 individuals (4.5 percent) in Johor who owned companies paid *zakat* through *zakat* institution in 2012 (Razaly et al., 2014). In the Federal Territory, *zakat* payment was also low, with only 30% who pay formally to the *zakat* centre (Ghazali, et al., 2016). This would suggest that this channel require specific attention to tackle financial inclusion in Malaysia. Issues and problems related to *zakat* [see, for example Ahmad (2018); Ahmad Razimi et al., (2016); Johari et al., (2015); Mohd Ali et al., (2015); Ali & Aziz (2014)] and cash *waqf* [see, for example Adeyemi et al., (2016); Ismail et al., (2014); Osman et al., (2012); Chowdhury (2011)] in Malaysia need to be carefully addressed in order to attain positive and meaningful impact to the society through inclusiveness of financial access.

On a different note, there are differences between the existing IFI (Abdul Rahman, 2013, 2017) and suggested IIFIFI in this study as shown in Table 5. The inclusion index without Islamic social finance indicators is relatively higher as compared to the index incorporating those Islamic finance elements. This could be explained by the equal weightage distributed to the dimensions with *zakat* and cash *waqf* indicators. Since the importance of those indicators is taken into consideration, the general low level of sub-indices for *zakat* and cash *waqf* relatively impact the total IIFIFI. Further actions on *zakat* and cash *waqf* management should be in place to improve the index in the future as mentioned above.

Table 4: Comparison of Index of Financial Inclusion (IFI) and Integrated Islamic Finance-based Index of Financial Inclusion (IIFIFI) in 2011 and 2015

Index	2011	2015
Index of Financial Inclusion (IFI)	0.77	0.90
Integrated Islamic Finance-based Index of Financial Inclusion (IIFIFI)	0.67	0.87

This study is subject to some limitations due to the fact that the attempt to compute this Islamic-based financial inclusion index in Malaysia is in preliminary stage. The results of the study were based on a relatively small sample where data on both financial access indicators as well as Islamic finance indicators are required to be available and expanded. Although the financial access indicators data used in this study are readily available [i.e., using the existing data by Abdul Rahman (2012, 2017)], the full and specific data with wider coverage is largely absent which limits the present study to compute a better and more comprehensive financial inclusion index (i.e., to include more dimensions and more type of financial services with greater span of data). Similarly, the Islamic finance data is not much available in the standard databases, hence manual data collection from the institutions' website was required. On top of that, the integration element of Islamic finance in the index involved two indicators only under Islamic social finance channel. A better picture could be attained by incorporating other tools for example Islamic microfinance and Islamic crowd funding. Furthermore, a comprehensive Islamic finance-based financial inclusion index should also take into consideration indicators from all the other sectors under the umbrella of Islamic finance namely Islamic banking, Takaful as well as Islamic capital market instruments.

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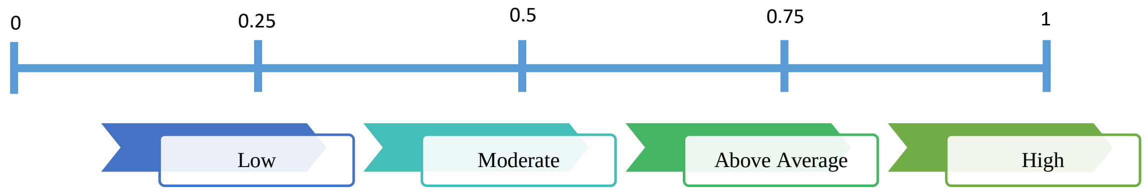
Table 5: Summary of IIFIFI Computation in 2011 and 2015

Dimension	Indicators	Data		Target/ Frontiers (Min & Max value)	Index of each Indicator		Weight	Index of each Dimension		Equal Weighted Dimension	Equally Distributed IIFIFI	
		2011	2015		2011	2015		2011	2015		2011	2015
Convenient Accessibility	% of sub-district with at least 2000 population with at least 1 access point	46%	96%	90%	0.51	1.07	0.5	0.71	1.05	0.20	0.67	0.84
	% of population living in sub-district with at least one access point	82%	98%	95%	0.90	1.03	0.5					
Take-Up Rate	% of adult population with deposit accounts	92%	91%	95%	0.97	0.96	0.5	0.78	0.71	0.20		
	% of adult population with financing accounts	36%	25%	50%	0.72	0.50	0.25					
	% of adult population with life insurance/takaful policies	18%	16%	40%	0.45	0.40	0.25					
Responsible Usage	% of customers with active deposits	87%	92%	90%	0.97	1.02	0.5	0.99	1.02	0.20		
	% of customers with performing financing accounts	97%	98%	97%	1.00	1.01	0.5					
Satisfaction Level	% of customers who are satisfied − Overall financial services	61%	73%	80%	0.76	0.91	1.0	0.76	0.91	0.20		
Islamic Social Finance	Total of *zakat* collection (RM'000 mil)	1.641	2.490	0.034/0.394 (2011)	0.17	0.16	0.30	0.13	0.50	0.20		

			0.062/0.627 (2015)			
Total of *zakat* distribution (RM'000 mil)	1.388	2.782	0.027/0.373 (2011) 0.045/0.676 (2015)	0.13	0.16	0.30
Total of cash *waqf* collection (RM'000)	0.396	2.033	0.369/2.033	0.19	1.00	0.20
Total of cash *waqf* distribution (RM'000)	0.021	1.237	0.021/1.237	0.02	1.00	0.20

1.00 0.00 – 1.00

Index ranges from 0-1, with 1 being perfect financial inclusion



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Article

CONCLUSION

Preferably, one should take into consideration as many as possible dimensions to attain a comprehensive and holistic view of the Islamic finance approach of financial inclusion. As evident from the tables, by integrating *zakat* and cash *waqf* to represent Islamic finance indicators, it could provide a better understanding of the level of financial inclusion in Malaysia. Putting an equal weightage of Islamic social finance dimension in calculating the index signifies the equal important of having good implementation of *zakat* and cash *waqf* to promote financial inclusion. These channels are typically tailored to the low-income group which considered as an underserved market in the mainstream financial system.

It is found that the level of financial inclusion using Islamic finance indicators in Malaysia is between above average and high. The overall index level increased from 0.67 in year 2011 to 0.84 in year 2015. It is perhaps not surprising that the Islamic social dimension index is the lowest as compared to the other dimensions. This indicates that this channel requires specific attention to tackle financial inclusion in Malaysia. The sub-indexes are useful guides for policymakers and other stakeholders to identify the strengths and weaknesses of the respective business and social environments and could prioritise areas that need further attention. Management of *zakat* and cash *waqf* should be strengthened by the parties involved. More efforts and promotion for *zakat* and cash *waqf* collection should be put in place so that many recipients could benefit from these financial sources.

In addition, only two indicators within the Islamic social finance channel are used to compute the index. Other mechanisms, such as Islamic microfinance and Islamic crowd funding, could be used to create a more complete picture. Additionally, a comprehensive Islamic finance-based financial inclusion index should take into account statistics from all other Islamic finance-related sectors, such as Islamic banking, Takaful, and Islamic capital market instruments. With this regard, a solely comprehensive index of Islamic financial inclusion is warranted by incorporating all the possible Islamic finance parameters.

It is hoped that the findings would be useful for the development of financial inclusion index using Islamic finance approach and monitoring the impact of *zakat* and cash *waqf* to the society. To end the present study, we could conclude that although not largely prevalent, using the Islamic finance dimension through social finance indicators has found some empirical support on its importance with the incidence of financial inclusion index level. To a certain extent, this study presents fresh empirical evidence of the role of Islamic finance in shaping level of financial inclusiveness in general. It seems that the notion of "unfinished agenda" in the area of financial inclusion as purported by Beck and Demirguc-Kunt (2008) remains to be valid for many years to come.

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