FINANCIAL INCLUSION THROUGH ISLAMIC FINANCE: MEASUREMENT FRAMEWORK

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ABSTRACT

The promotion of achieving financial inclusion through Islamic finance is considered an agenda priority in many countries especially where Muslims population is dominant. 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. Building on the recent papers on financial inclusion index, this paper addresses the dimensions and indicators related to the computation of financial inclusion index based on Islamic finance. Some evidences suggest that the measurement of index needs to take into consideration as many dimensions as possible that impact the factor studied. Hence, incorporating as many dimensions as possible will result in a more holistic of financial inclusion index in the light of Islamic finance's core objectives. This paper attempts to fill this gap by proposing the founding principles in financial inclusion index based on Islamic finance. The principles incorporate the two-pillar approach (i.e. risk-sharing/risk taking and wealth distribution) in determining the basic dimensions and indicators within the ambit of Islamic finance. By doing so, we hope to shed light on the parameters that are crucial in the index computation.As far as financial inclusion index is concerned, the issue of data limitation is expected in building this Islamic finance based index. With regard to the computation of financial inclusion index, while numerous amounts of data are available on many aspects of the financial sector, systematic indicators of inclusiveness of the financial sector are not. As a consequence, the second purpose of the paper is to examine the data available for the computation of financial inclusion index based on Islamic finance as well as issues pertaining to it.

Keywords: Financial inclusion, Islamic finance, index, risk sharing/risk taking, wealth distribution

INTRODUCTION

The aim 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. As has been suggested by Iqbal & Mirakhor (2013), conventional finance is not entirely successful in addressing this issue as the existing conventional financial instruments does not really reach the poor. Although there

is a microfinance mechanism that supposedly cater such group, its effectiveness is often limited by profit motive and the refusal of the microfinance provider to take high risks (Abd Elrahman, 2015).

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 a strange concept to Islamic finance because Islam itself emphasizes inclusion, equality and justice (Iqbal & Mirakhor, 2013). It is believed that only through the integration of the Shariah-based instrument, the level of access to finance can be improved. It can be said that the Islamic financial system has a more comprehensive framework in addressing financial inclusion, especially involving those 'unbankable' individuals. However, to what extent Islamic finance promotes financial inclusion is still unclear. This is due to uniform measure of financial inclusion using the Islamic finance approach does not exist.

The present study is timely in providing a picture of the need for Islamic finance based financial inclusion measurement, and further proposing development of the index.

The next section provides a brief discussion on the role of Islamic finance towards financial inclusion. The outline of the development of financial inclusion index based on Islamic finance elements and the limitations are presented in the following sections, respectively. The conclusion is presented in the last section.

ISLAMIC FINANCE AND FINANCIAL INCLUSION: A REVIEW

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 society as a whole. With the application of the work ethic, wealth distribution, social and economic justice and the role of the state, Islamic financial system considers to be 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.

The fundamental spectrum of Islamic finance is described in the Quran; Allah has allowed *al-bay'* (trade) but prohibits Riba (Al-Baqarah: 275). Halim (2001) quotes from three of the leading commentaries on the Quran (i.e., Ibn al- `Arabi, al-Qurtubi and al-Jassas) to elaborate the meaning of *al-bay` and al-riba* and

the issue of their permissibility or vice versa in the light of the above verse. In conclusion, he makes the following remarks[6]:

i.   The term *al-bay' in* its generic meaning includes all types of exchange contracts except those forbidden by the Shariah.

ii.   *Al-bay'* is defined as any contract of exchange whereby a given quantity of a commodity or service is exchanged for a given quantity of another commodity or service.

iii.   The delivery of the commodity or service on the part of each party to the contract may be simultaneous, i.e., on the spot, or one of them (i.e., not both) may defer the discharge of his obligation to a future date.

iv.   The term *al-bay'* thus covers many types of deferred contracts of exchange including *salam* sale (*bay' al-salam*), sale on order (*bay' al-istisna*), and leasing (*al-ijarah*).

Al-bay' covers long-term investment contracts that allow the growth of employment and income and expansion of the economy. The center of *al-tijarah* (business) and all its financing instruments is trade of commodities which are already produced. Hence, Islam meets the financing needs of trade as well as the necessities of resource allocation, investment, production, employment, income creation, and risk management (Mirakhor, 2010) which could lead to financial inclusion.

According to Mohieldin, Iqbal, Rostom & Fu (2011), 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 target 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, 2013).

However, Hasan (2015) argue 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 creates 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

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6   Halim (2001) claims that the three commentaries he refers to are unanimous on this interpretation of the verse.

and sharing) is the pleasing alternative. This is very much consistent with what has been outlined by Halim (2001) who shed 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).
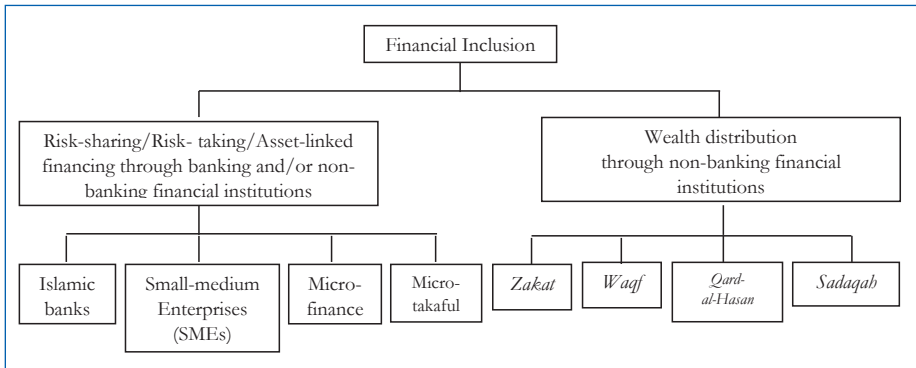
On top of that, the concept of redistribution of wealth is based on the concept of balanced society in Islam that tried to avoid the occurrence of extreme wealth and poverty. Among the redistribution instruments that can be used are *zakat, sadaqah* and *waqf*.

Zakat, as one of the pillars in Islam, is an ordained rule for wealth redistribution that targets the needy, 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, 2013). On the other hand, *sadaqah* is a voluntary charitable contribution, which according to Islam, operationalizes the truth of one's belief in God. Such payment is said to be the rights of the poor in the income and wealth of the rich (Iqbal & Mirakhor, 2013). Another instrument, the *waqf*, also seeks to mobilize large amount of financial resources in a way which the contributors endow the stream of income accruing to a property for a charitable purpose in perpetuity (Iqbal & Mirakhor, 2013). All these instruments are a form of wealth transfer and it reaches to the needy, parallel with the Islamic principles of property rights for all.

In brief, as stated in many studies pertaining to the role of Islamic finance in promoting financial inclusion (e.g., Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom, & Fu, 2012: El-Zoghbi & Tarazi, 2013; MIFC, 2015), Islamic finance could contribute to greater inclusion in two essential ways, namely promoting risk-sharing and risk taking contracts that provide a viable alternative to conventional debt-based financing, and the other through specific instruments of redistribution of the wealth (e.g., through *zakat,, waqaf, sadaqah,* etc) among the society. This is shown in **Figure 1**.

Financial inclusion through Islamic finance

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                          ┌─────────────────────┐
                          │ Financial Inclusion │
                          └─────────────────────┘
              ┌────────────────────────┴─────────────────────────┐
┌───────────────────────────────┐          ┌──────────────────────────────┐
│ Risk-sharing/Risk- taking/Asset-linked │  │      Wealth distribution      │
│ financing through banking and/or        │  │  through non-banking financial│
│   non-banking financial institutions    │  │         institutions          │
└───────────────────────────────┘          └──────────────────────────────┘
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| Islamic banks | Small-medium Enterprises (SMEs) | Micro-finance | Micro-takaful | *Zakat* | *Waqf* | *Qard-al-Hasan* | *Sadaqah* |

The main weakness of the conventional perspective of financial inclusion is its failure to acknowledge both concept of risk sharing/risk taking and 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 fund and lacking skills of the recipients (Iqbal & Mirakhor, 2012). 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, the 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 (Dermirguc-Kunt, Beck & Honohan, 2007).

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 risk sharing and 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 MIFC (2015), the collection of *zakat* and various Shariah-based microfinance programs offered in Malaysia, Indonesia and Bangladesh have managed to raise the living standards of low-income groups and increase the number of entrepreneurs in these countries, as they helped to increase the involvement of low income groups in the financial sector.

Based on these justifications, this paper suggests that financial inclusion index should consider the Islamic instruments of risk sharing and risk taking (i.e., *musharakah, mudharabah*, *murabahah*, *ijarah*, etc.) as well as redistribution of wealth (i.e., *zakat, sadaqah, waqf*, etc.).

The purpose of this study, therefore, is to propose a framework of Islamic finance based index of financial inclusion. This attempt takes into account construction of Islamic finance based index of financial inclusion by looking into the process of setting up parameters in determining a multi-dimensional and multiple indicator aspects to cover a range of dimensions of Islamic finance. Further, it examines the data which is compatible in computing the index. Above all, this study recognizes limitation and issues which need further research.

Current Measurement of Financial Inclusion

While numerous amounts of data are available on many aspects of the financial sector, systematic indicators in measuring financial inclusion are far from complete. Most of the evidence concerning the causal links between financial development, growth, and poverty comes from aggregate data using, for example, financial depth measures (size of finance) rather than outreach or access measures (number of participants) (e.g., Beck, Levine, & Loayza, 2000; Demirgüç-Kunt & Maksimovic, 2002; Klapper, Laeven, & Rajan, 2006; Beck, Demirgüç-Kunt, & Levine, 2007).

Moreover, despite a large developing literature on financial access, a single measurement of financial inclusion that can be applied across countries simply does not exist. Besides, limited data on the use of basic financial services by households and firms (Claessens, 2006), this constraint is also due to the continuous modifications that are being made to provide a more comprehensive measure of financial inclusion. This would suggest that the dimensions and indicators of financial inclusion that could explain and track the incidence of financial inclusion over time are still far from conclusive.

The current finance literature on identifying barriers to financial inclusion is mainly focusing on the credit and saving services provided by the banking sectors. This has resulted in several papers discussing the measurement of financial inclusion using banking indicators (e.g., Beck, Demirguc-Kunt, & Martinez Peria, 2007; Honohan, 2008; Sarma, 2008; Arora, 2010; Chakravarty & Pal, 2010; Gupte, Venkataramani, & Gupta, 2012). Some of the authors also attempt to derive an index for the level of financial inclusion by identifying valuable dimensions of financial access. However, it can be argued that such early research in the financial inclusion measurement is very limited to savings and credits data, while ignoring other essential financial services namely banking transactions, insurance, etc.

While still far from conclusive, a limited number of studies suggest that the measurement of financial inclusion needs to take into account as many

dimensions as possible to represent the financial inclusion. Apart from that, by including the four essential financial services as outlined by the World Bank (i.e., banking transaction, credit, saving and insurance), the comprehensiveness of the index could be improved. **Table 1** summarizes the dimensions and indicators considered by previous studies.

Table 1:

Summary of studies associated with dimensions and indicators for the measurement of financial inclusion/exclusion

Authors	Financial Services	Dimension				
		Outreach		Usage	Ease	Cost
		Penetration	Availability			
Beck, Demirguc-Kunt & Martinez Peria (2007)	Banking	● Demographic branch penetration (number of bank branches per 100,000 people) ● Demographic ATM penetration (number of bank ATMs per 100,000 people)	● Geographic penetration (number of bank branches per 1,000 sq.km) ● Geographic penetration (number of bank ATMs per 1,000 sq.km)	● Credit indicators: i. Credit accounts per capita : number of loans per 1,000 people ii. Credit-income ratio: average size of loans to GDP per capita ● Deposit indicators: i. Deposit accounts per capita: number of deposits per 1,000 people ii. Deposit-income ratio: average size of deposits to GDP per capita	Not considered	Not considered

Authors	Financial Services	Dimension				
		Outreach		Usage	Ease	Cost
		Penetration	Availability			
Honohan (2008)	Banking and Microfinance	● Demographic bank penetration (number of bank accounts per 100 adults) ● Demographic MFIs and alternative intermediaries penetration (number of accounts at MFIs and alternative intermediaries per 100 adults)	Not considered	● Average bank deposit size	Not considered	Not considered
Sarma (2008)	Credit; savings	● Demographic bank penetration (number of bank account per 1000 adults)	● Demographic branch availability (number of bank branches per 100,000 adults)	● Credit indicators: i. Domestic credit (as % of GDP) ● Deposit indicators: Domestic deposit (as % of GDP)	Not considered	Not considered
Mersland & Øystein Strøm (2009)	Credit	● Average loan ● Number of credit clients	Not considered	Not considered	Not considered	Not considered
Chakravarty & Pal (2010)	Credit; savings	Use dimensions and indicators stated in Beck, Demirguc-Kunt & Martinez Peria (2007) and Sarma (2008)			Not considered	Not considered

Authors	Financial Services	Dimension				
		Outreach		Usage	Ease	Cost
		Penetration	Availability			
Arora (2010)	Credit; savings	● Demographic branch penetration (number of bank branches per 100,000 people) ● Demographic ATM penetration (number of bank ATMs per 100,000 people)	● Geographic penetration (number of bank branches per 1,000 sq.km). ● Geographic penetration (number of bank ATMs per 1,000 sq.km)	Not considered	● Locations to open deposit account ● Minimum amount to open checking account ● Minimum amount to open savings account ● Minimum amount to be maintained in checking account ● Minimum amount to be maintained in savings account ● Number of documents to open checking account	● Fees consumer loan (% of minimum loan amount) ● Fees mortgage loan (% of minimum loan amount) ● Annual fees checking account ● Annual fees savings account ● Cost of transfer funds internationally (% of $250) Amount of fees for using ATM cards (% of $100)

Authors	Financial Services	Dimension				
		Outreach		Usage	Ease	Cost
		Penetration	Availability			
					● Number of documents to open savings account ● Locations to submit loan applications ● Minimum amount of consumer loan ● Minimum amount of mortgage loan ● Days to process consumer loan application ● Days to process mortgage loan application	
Gupte, Venkataramani & Gupta (2012)	Credit; savings	Integrate all four dimensions initiated by Sarma (2008) and Arora (2010) to compute Financial Inclusion Index for India				

Authors	Financial Services	Dimension				
		Outreach		Usage	Ease	Cost
		Penetration	Availability			
Prathap (2011)	Banking transactions, savings, credit and insurance	Not considered	Not considered	● Banking transaction: usage of Cheque/DD, social security pension payments through banks/ cooperatives, usage of ATM Savings: Savings account with institutional sources (commercial bank, cooperative bank or post office or SHG[7] bank linkage), Fixed Deposit or Recurring Deposit account with institutional agencies, Informal savings in an SHG ● Formal credit: From institutional sources or through SHG bank/MFP[8] linkage during 2007, 2008 and 2009 Insurance: Any source/type of insurance	Not considered	Not considered

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[7] Self- help groups (SHGs), is one of policy under the Reserve Bank of India to provide channels of lending.

[8] Microfinance provider (MFP) includes all agencies that provide finance (credit/grants) to the SHGs as part of their financial assistance to poor.

Since the existing paradigm is based on neo-liberalism, one can argue that financial inclusion is very much explained through access to banking, i.e., bank accounts, loans, etc. (i.e., all the measures are product of neo-classical and neo-liberal political economics). One of the reasons might lie on the basis that the banking sector has taken a lead role in promoting financial inclusion through the efficacy of financial system (Sarma & Pais, 2011).

However, looking from another perspective, financial inclusion is also worth to be observed under the purview of developmentalism (see for example, Schwittay (2014) and Kalpana (2015)even as it contributes to maintaining the world capitalist system. In India the inception of microfinance-based Self Help Groups (SHGs) and should therefore relate to emancipation and empowerment. It should be noted that, in the case of loans, the current debate on financial inclusion relates to 'indebting' people rather than empowering (see for example Lazzarato, (2012)). This empowerment aspect is much related to human development itself. On this matter, Sarma & Pais (2011) attempt to compare their financial inclusion index in relation to the Human Development Index (HDI)[9]. They concluded that countries having high level of human development are also the countries with a relatively high level of financial inclusion. Nevertheless, the HDI simplifies and partially captures some aspects of human development. It does not reflect on the aspect of empowerment indicator (UNDP, 2017).

In the context of Islamic political economy, the empowerment paradigm is captured through *maqasid al-shariah*. It is regarded as the core of human life, without which the human's life will be uncertain and aimless. With its observance, human life will be directed objectively (Mohammad & Shahwan, 2013). With regards to socio-economy in Islamic perspective, *maqasid al-shariah* stands as its pillar and base while its development and issues are the manifestation of the pillar. Hence, Islam has taken into account the importance of "purpose" or in Arabic "*maqsud*" and in plural sense "*maqaasid*", to guide human life.

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[9] The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions. The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by gross national income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI. The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean. For details, refer http://hdr.undp.org/.

[10] The Arabic speech of Allah that was revealed to the Prophet Muhammad both in word and in meaning. It is collected between the two covers of the mushaaf (i.e., Quran), was narrated in mutawaatir (chains), and is a challenge to humankind.

[11] In brief, it is the tradition portion of Muslim law, based on words and acts of Prophet Muhammad and preserved in the traditional literature.

By referring to the *Quran*[10] and the *Sunnah*[11] as well as definitions and explanation from a number of scholars, Chapra (2007) concludes that all the *raison d'être* of the Shariah which, as recognized by almost all the jurists, is to serve the interests of all human beings and to save them from harm. These two essential aspects (i.e, to serve the interests of all human beings and to save them from harm) are the key elements for empowerment. With regards to financial inclusion, there are many areas of empowerment that can be considered as well as measured under the framework of *maqasid al-shariah*. For example, Imam Abu Hamid al-Ghazali, an eminent scholar, classified the *maqasid* into five major categories by stating that, "the very objective of the Shariah is to promote the well-being of the people, which lies in safeguarding their faith (*din*), their self (*nafs*), their intellect ('*aql*), their posterity (*nasl*), and their wealth (*mal*). Whatever ensures the safeguard of these five, serves public interest and is desirable, and whatever hurts them, is against public interest and its removal is desirable"(Chapra, 2000).

With respect to the study on *maqasid al-shariah* in socio-economy in general, Chapra (2007) and Mohammad & Shahwan (2013) have made a great contribution in shedding the light of connecting these two essential scopes, i.e., *maqasid al-shariah* and socio-economic. Based on the theory of five *maqasid* that has been mentioned earlier (i.e., primary *maqasid*), Chapra (2007) came out with the corollaries *maqasid* for each of the primary *maqasid*, respectively. **Figure 2** shows the relationship between the five *maqasid*, human development and well-being, while **Figure 3** to **Figure 7** present the corollaries for each of the five primary *maqasid*, namely the human self (*nafs*), faith (*din*), intellect ('*aql*), posterity (*nasl*) and wealth (*mal*).
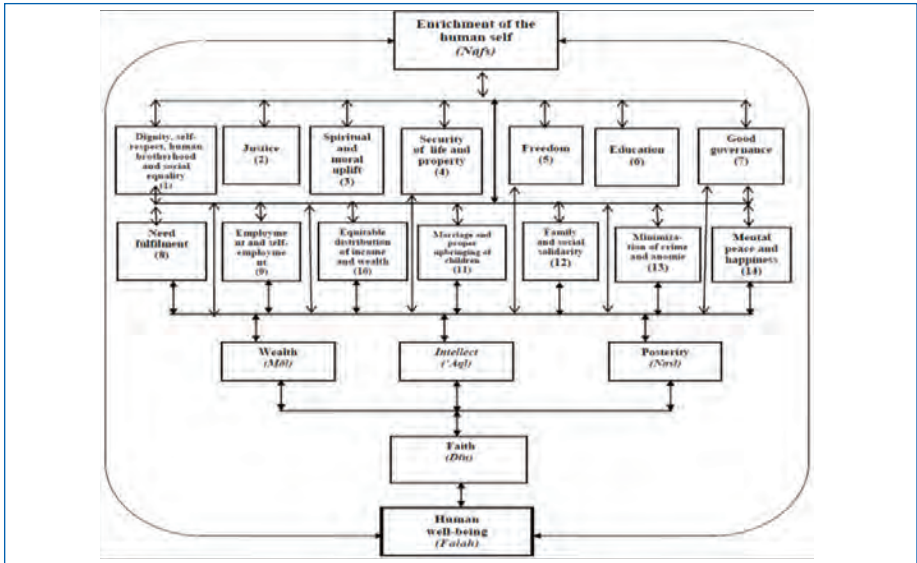
Figure 2:

Realizing human development and well-being through *maqasid al-shariah*
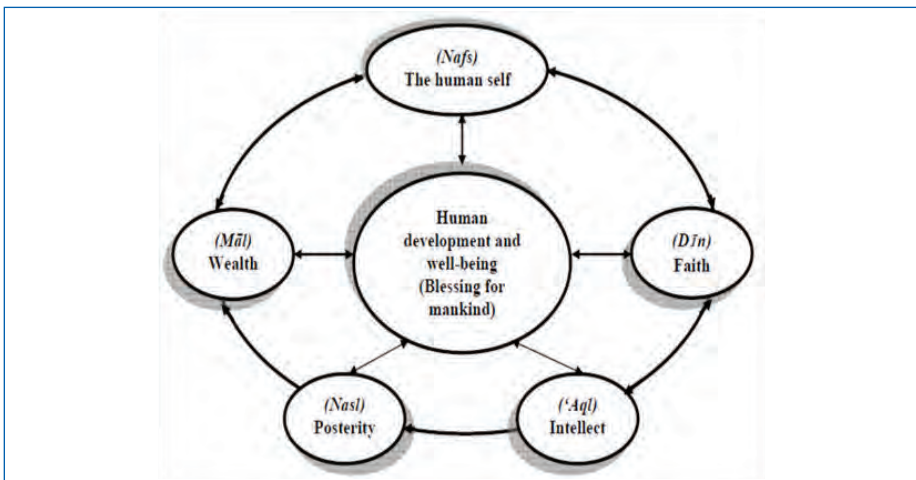
Source: Adopted from Chapra (2007)

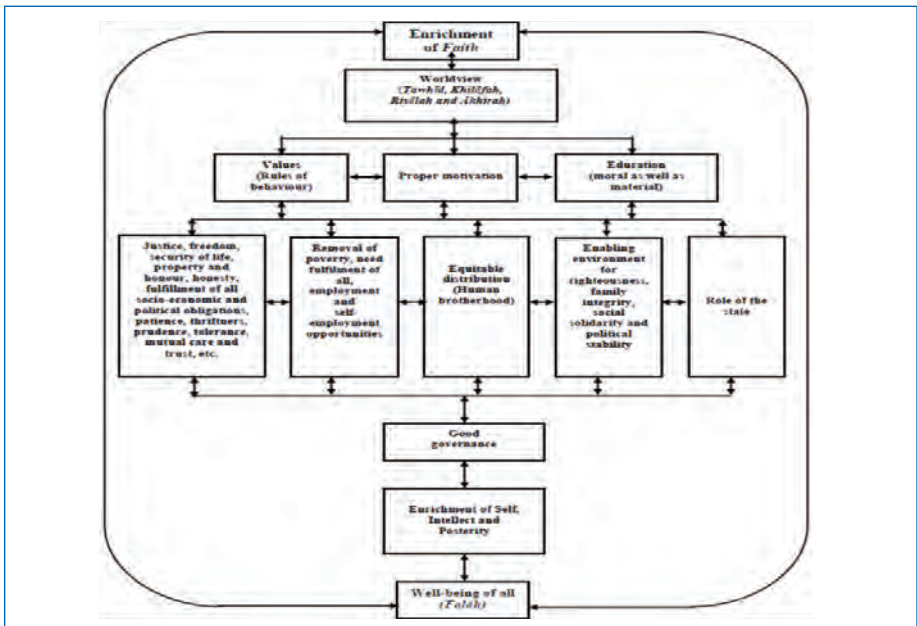**The corollaries of human self (*nafs*) *maqasid***
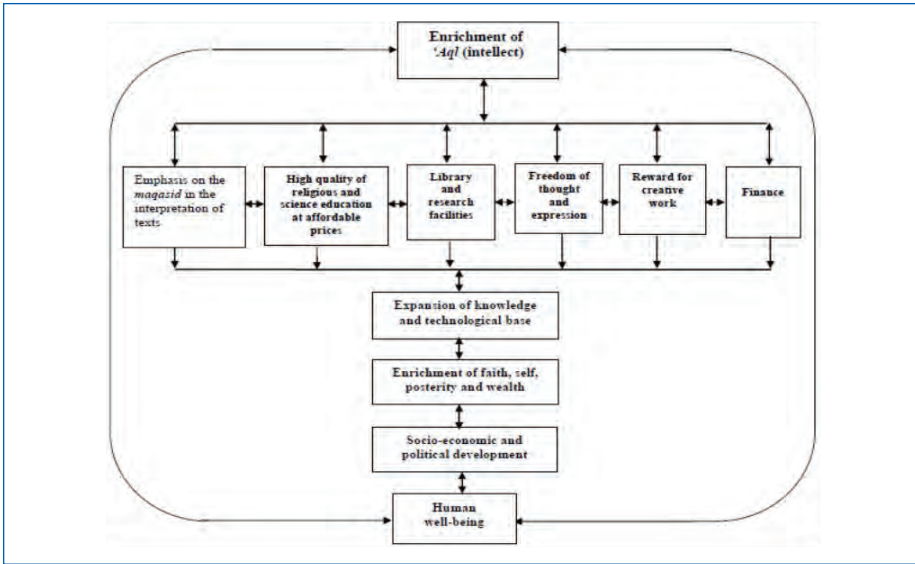

Source: Adopted from Chapra (2007)

The corollaries of faith (*din*) *maqasid*
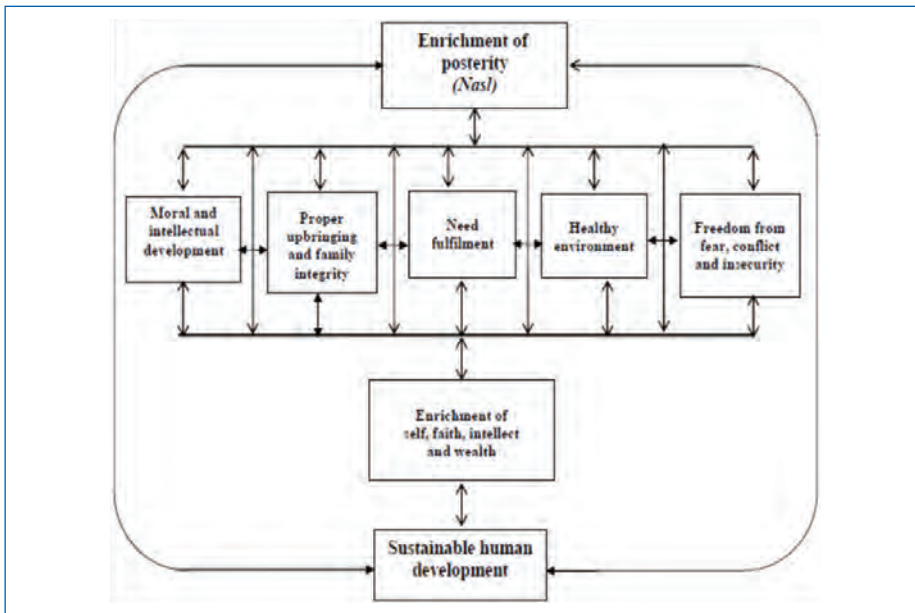

Source: Adopted from Chapra (2007)

Figure 5:

The corollaries of intellectual (*aql*) *maqasid*
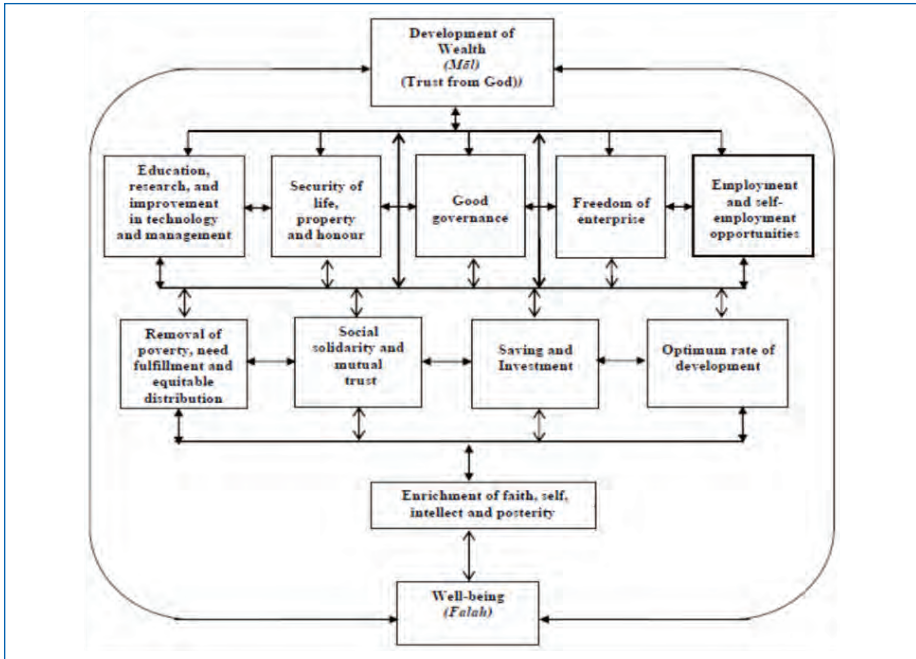

Source: Adopted from Chapra (2007)

Figure 6:

The corollaries of posterity (*nasl*) *maqasid*

Source: Adopted from Chapra (2007)

The corollaries of wealth (*mal*) *maqasid*

Source: Adopted from Chapra (2007)

Mohammad & Shahwan (2013) analyse critically the conceptual association between the framework of *maqasid al-shariah* that is rooted from both al-Ghazali and al-Zaharah[12] as well as the objectives of Islamic economics and Islamic banking and finance. Adopting content analysis and inductive method, they originated alternative version of the *maqasid al-shariah* framework as well as the objectives of Islamic banking and finance and Islamic economics. This is shown in **Figure 8**. L1, L2, L3 and L4 represent the following title respectively: the two main types of objective; philosophical-based and operational-based objectives, objective of Islamic economics, VMO (i.e., vision, mission, objective) of Islamic Bank and the *maqasid* framework.

[12] For further details, refer Abu Zaharah (1997) and its brief explanation in Mohammad & Shahwan (2013).

The conceptual association between *maqasid al-shariah* framework and the objectives of Islamic Banks and Islamic Economics
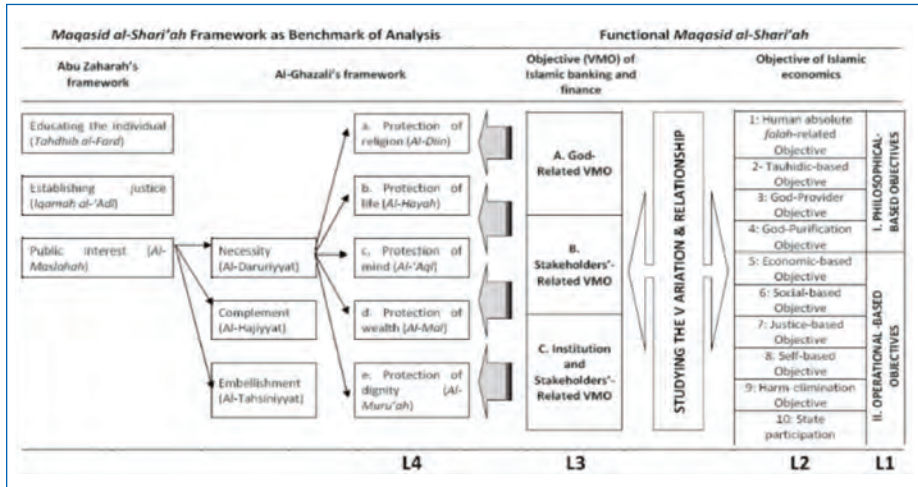
Source: Adopted from Mohammad & Shahwan (2013)

It is worth noting that there are increased interests in deliberating the realization of *maqasid al-shariah* in different areas that range from Islamic banking and Islamic economies (see, for example, al-Mubarak & Osmani, 2010; Eddy Yusof, Kashoogie, & Kamal, 2010; Mohammad & Shahwan, 2013; Rosly, 2010), democracy and development (see, for example, Çizakça, 2007), capital market (see, for example, Dusuki, 2009, 2010) to social aspect (see, for example, (Laluddin et al., 2012). Some of these studies also highlight the importance of risk-sharing and risk taking elements towards the realization of *maqasid al-shariah*, or in other words, to promote Islamic finance development through empowerment.

However, these studies are rather normative than positive and have not specifically discussed the subject of *maqasid al-shariah* in relation to financial inclusion. Not to mention, the use of this maqasidic approach in measuring financial inclusion by incorporating the empowerment aspect is very limited. Therefore, our understanding of the comprehensive measurement of financial inclusion remains incomplete especially under the spectrum of Islamic finance.

DEVELOPING ISLAMIC FINANCE BASED INDEX OF FINANCIAL INCLUSION

This section presents the construction of Islamic finance based index of financial inclusion. It starts by discussing the parameters and methodology. The suggested index, and indicators/variables are also highlighted. Next, data collection is further explained respectively.

Parameters

Some evidences suggest that the measurement of index need to take into consideration as many dimensions as possible that impact the factor studied (see, for example Sarma, 2008; Kumar & Mishra, 2009; Arora, 2010; Gupte, Venkataramani, & Gupta, 2012). Therefore, incorporating as many dimensions as possible will result in a more holistic of financial inclusion index in the light of Islamic finance. These dimensions act as a benchmark in looking into the specific area of the study. Therefore, these dimensions need to be measureable and answerable. To fulfil this aim, indicators of each of the dimension are crucial.

The two parameters are dimensions and indicators. These parameters should be complementary to one another. By doing so, the index is reliable and thus helps to measure financial inclusion using Islamic finance approach. This parameters are grounded from the work contributed by Chapra (2007).

With regard to the dimension parameter, this index focuses on four dimensions based on the core elements of Islamic finance (i.e., risk sharing and wealth distribution) as highlighted in many studies (e.g., Mirakhor & Iqbal, 2012; Mohieldin, Iqbal, Rostom & Fu, 2012; El-Zoghbi & Tarazi, 2013; MIFC, 2015) and presented in Figure 1. These dimensions are chosen due to potential data available for the index construction. They are:

i.   Use/access to Islamic banking products/services

ii. Use/access to Islamic microfinance products/services

iii. Use/access to *zakat*

iv. Use/access to *waqf*

With regard to the second parameter (i.e., indicator), detail discussion on the variables and sources of data is presented in indicators/variables section.

This section outlines the construction of Islamic finance based index of financial inclusion (hereafter referred to as IFIFI) with reference to studies done by Sarma (2008), Arora (2010) and Prathap (2011) in constructing financial inclusion index. This study is a gateway to develop the first IFIFI which focuses on one important aspect, i.e., inclusion of the two core principles of Islamic finance (i.e., risk sharing and redistribution of wealth).

Since an inclusive measurement of IFIFI should tackle the four dimensions as mentioned above, this study suggests a multidimensional approach in constructing the index. Similar to prior studies on financial inclusion computation, this study also employs UNDPs computations of some well-known development indexes such as the Human Development Index (HDI), the Human Poverty Index (HPI), and the Gender-related Development Index (GDI).[13]

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[13] For more details, see Technical Note in UNDP's Human Development Reports at www.undp.org

Basically, this study follows similar methodology and reasoning (i.e., dynamic concept) as employed by Sarma (2008). Hence, for each dimension, *n* numbers of variables are included:

$$d_i = x_1, x_2, x_3.....x_n \qquad \text{Eq. (1).}$$

where:

d_i = Islamic finance dimension,
x = variable, and
$_i$ = individual countries.

For each variable, d_i is computed using the Linear Scaling Technique (LST) as follows:

$$d_i = w_i \frac{A_i - m_i}{M_i - m_i} \qquad \text{Eq. (2).}$$

where:

w_i = weight attached to the dimension i, $0 \leq w_i \leq 1$
A_i = actual value of dimension $_i$,
m_i = minimum value of dimension $_i$, fixed by some pre-specified rule, and
M_i = maximum value of dimension $_i$, fixed by some pre-specified rule.

Termed as 'goalposts' (UNDP, 2009), the minimum and maximum values are the minimum and maximum value of each variables in different countries. *mi* is the lower limit for dimension *i*, given by the observed minimum for dimension i and *Mi* is the upper limit for dimension *i*, given by the empirical 94th quantile for dimension *i*.

Eq. (2) ensures that $0 \leq d_i \leq w_i$. Higher value of d_i indicates higher achievement in dimension *i* of the country. If *n* dimensions of financial inclusion are considered, then, a country will be represented by a point $D = (d_1, d_2, d_3, ...d_n)$ on the n-dimensional Cartesian space.

In the *n*-dimensional space, the point $0 = (0, 0, 0,...0)$ signifies the point indicating the worst situation while the point $W = (w_1, w_2, ...w_n)$ denotes the highest achievement in all dimensions. The cumulative index of financial inclusion, IFIFI, for a country, is then measured by the normalized inverse Euclidean distance of the point D from the ideal point $I = (w_1, w_2, ...w_n)$. Thus, the formula is:

$$\text{IFIFI} = 1 - \frac{\sqrt{(w_1-d_1)^2 + (w_2-d_2)^2 + .. + (w_n-d_n)^2}}{\sqrt{(w_1^2 + w_2^2 + \cdots w_n^2)}} \qquad \text{Eq. (3).}$$

where:

$d =$ inclusion dimension, and

$n =$ number of variable.

In Eq. (3), the numerator of the second component is the Euclidean distance of D from the ideal point W, normalizing it by the denominator and subtracting by 1 gives the inverse normalized distance. The normalization is done in order to make the value lie between 0 and 1 and the inverse distance is considered so that higher value of the IFIFI corresponds to higher financial inclusion.

As an illustration, if we consider all dimensions to be equally important in measuring the inclusiveness of a financial system, then $w_i = 1$ for all i. In this case, the ideal situation will be represented by the point $I = (1,1,1,\ldots,1)$ in the n-dimensional space and the formula for IFIFI will be:

$$\text{IFIFI} = \mathbf{1} - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + .. + (1-d_n)^2}}{\sqrt{n}}$$ Eq. (4).

Depending on the value of IFIFI, countries can be classified into three levels of financial inclusion, namely:

i. $0.5 \leq \text{IFIFI} \leq 1$: high

ii. $0.30 \leq \text{IFIFI} \leq 0.49$: medium

iii. $0 \leq \text{IFIFI} \leq 0.29$: low

The IFIFI thus, can be employed to measure financial inclusion at different point of time and at different levels of economic aggregation (country, state, province, etc).

The Suggested Index
In this suggested Islamic finance based financial inclusion index, four important dimensions are considered in measuring financial inclusion in Islamic perspective: use/access to Islamic banking products/services, use/access to Islamic microfinance products/services, use/access to *zakat* and use/access to *waqf*.

Therefore, considering the four dimensions – Islamic banking products/services (*ib*), Islamic microfinance products/services (*imf*), *zakat* (*z*) and *waqf* (*w*) - this study can present a country i by a point (*ib*, *imf*, *z*, *w*) where data availability is considered. The dimensions lie between 0 and 1, $0 \leq ib, imf, z, w_i \leq 1$, where *ib*, *imf*, *z*, w_i denote the dimension indexes for specific of Islamic finance based financial inclusion in country i computed using Eq. (2).

Except for *waqf* dimensions, several indexes are first calculated for the other dimensions as there are a few indicators for each dimensions. A weighted average

of these indexes, using pre-determined weight for each indicator is considered as the index for the dimensions. **Table 2** below summarized the suggested weightage for indicators for the two dimensions.

Table 2:

Summary of suggested weightage for indicators for IFIFI dimensions

Elements of Islamic Finance	Dimensions	Indicator	Weightage Average for the Dimension Index
Risk sharing/ Risk taking	Use of Islamic banking products and services	*Mudharabah* deposit	1/3
		Murabahah/Musharakah munataqisah financing	1/3
		Ijarah Muntahiah Bi al-Tamlik/ Al-Ijarah Thumma al Bai' (lease-based)	1/3
	Use of microfinance products and services	Average financing using Islamic contract	1/2
		Credit clients	1/2
Wealth distribution	Access and use of *zakat*	Share of zakat to GDP	1/3
		Total distribution of *zakat*	2/3
	Access to *waqf*	Total collection of cash *waqf*	-

After calculating the dimension indexes, weights are given to all the dimensions. Assuming all data is available, all four dimensions are given 1 each. In the four dimensional Cartesian space, the point (0, 0, 0, 0) indicates the worst situation (complete financial exclusion based on Islamic finance elements) and the point (1, 1, 1, 1) signifies the best or ideal situation (complete financial inclusion based on Islamic finance elements). Thus, the IFIFI for the country i is measured by the normalized inverse Euclidean distance of the point (ib_i, imf_i, z_i, w_i) from the ideal point (1,1,1,1). Algebraically,

$$IFIFI_i = 1 - \sqrt{\frac{(1\text{-}ib_1)^2 + (1\text{-}imf_i)^2 + (1\text{-}z_i)^2 + (1\text{-}w_i)^2}{4}} \qquad \text{Eq. (5).}$$

where:

ib = use/access to Islamic banking products/services,

imf = use/access to Islamic microfinance products/services,

z = use/access to *zakat*,

w = use/access to *waqf,* and

i = individual countries.

Apart from that, depending on the value of IFIFI, countries are classified into three categories, namely:

i.   0.5 < IFIFI ≤ 1   : high Islamic finance based financial inclusion

ii.   0.3 ≤ IFIFI <0.49 : medium Islamic finance based financial inclusion

iii. 0 ≤ IFIFI <0.29   : low Islamic finance based financial inclusion

It is worth noting that although the IFIFI proposed here follows a multidimensional approach of index construction similar to the UNDP approach, there are some methodological differences between the two approaches. These have been highlighted by Sarma (2008) as following:

i.   This index is based on a measure of the distance from the ideal[14] as opposed to the UNDP's methodology of using an average (a simple arithmetic average in case of the HDI, GDI and GEM and a geometric average for HPI). Nathan, Mishra, & Reddy (2008) have shown that this distance-based approach satisfies several interesting and intuitive properties of a development index, viz. normalization, symmetry (or anonymity), monotonicity, proximity, uniformity and signalling (collectively termed as NAMPUS). Desai (1991) also agreed on this by stating that as all dimensions are assumed to be equally important for the overall index value and the perfect substitutability can hardly be appropriate. The distance based approach does not suffer from this limitation.

ii. In terms of the choice of minimum and maximum values for the dimensions, the UNDP methodology uses pre-fixed values for the minimum and maximum for each dimension to compute the dimensional index. Whereas, this study uses empirically observed minimum and maximum for each dimension. Thus, the index is a dynamic one.

Indicators/Variables
This sub-section justifies and describes the variables for each Islamic finance dimension of financial inclusion. **Table 3** provides a summary of descriptions, indicators and explanations of each aspect related to the index construction. Based on the basic dimensions, the variables that can explain the Islamic finance dimensions of financial inclusion are included.

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[14] Sarma (2008) was introduced to this methodology that dates back to Zeleny (1974) by her colleague.

Table 3:

General description towards examining the indicators/variables for Islamic finance based index of financial inclusion

Elements of Islamic Finance	Dimensions	Indicator/Variable	Source of Data
Risk sharing/ Risk taking	Use of Islamic banking products and services	Total Mudharabah deposit fund	● Country's central bank ● Financial statements of Islamic banks
		Total Murabahah/ Musharakah munataqisah financing fund	
		Total Ijarah Muntahiah Bi al-Tamlik/ Al-Ijarah Thumma al Bai' (lease-based) fund	
	Use of microfinance products and services	Average financing using Islamic contract	● Country's central bank ● Financial statements of microfinance providers ● SMEs report
		Credit clients	
Wealth distribution	Access and use of *zakat*	Share of *zakat* to GDP	● www.mifc.com ● Report from zakat institution/religious body/authority
		Total distribution of *zakat*	
	Access to *waqf*	Total collection of cash *waqf*	● Report from *waqf* institution/religious body/authority

Data Collection

Ideally, one should take into consideration all the dimensions to arrive at a comprehensive picture on the Islamic finance approach of financial inclusiveness across the countries. Currently, there is a major constraint on data availability on the Islamic finance dimensions for the index computation. However, this is only possible if the databases on those financial services are readily available and reliable or further manual data collection of the required data items can be undertaken. No data collection is made or finality is claimed for the observations made herein. A major objective of this paper is to propose framework of Islamic finance based financial inclusion measurement as well as initiate debate and discussion on an important subject in the area of financial inclusion.

Limitations and Suggestions for Further Research

This study has some limitations. Although the methodology of index computation has been presented, a working example of IFIFI computation is not presented due to data constraint. This will require further data collection and separate research effort. The Islamic banking data, as well as data on microfinance, *zakat* and *waqf*, are not much available in the standard databases, hence manual data collection from their financial statements/reports are required. The actual IFIFI computation is also beyond the scope of this paper which is to propose a framework of Islamic finance based financial inclusion index.

The other Islamic finance dimensions i.e, micro *takaful, qard al hasan, sadaqah*, etc are also areas of concern. These are among the instruments of Islamic finance which could complement the index construction hence allowing index comprehensiveness. Therefore, for each dimension of Islamic finance, it is important that the relevant data is available and included in setting up the parameters.

CONCLUSION

This paper is a humble attempt to look at the needs for Islamic finance based financial inclusion index as well as to propose framework for construction of Islamic finance based index of financial inclusion. The inner objective of the authors is to provide a better picture on the Islamic finance perspective in financial inclusion index computation. The observation of previous studies concluded that the four instruments/dimensions of Islamic finance (i.e., use/access to Islamic banking products, Islamic microfinance products, *zakat* and *waqf*) were fully recognised in the construction of financial inclusion index. In addition, this study endeavours the construction of the Islamic finance based index of financial inclusion. In the next step, a systematic effort on data collections and parameters' setting needs to be in place in order to efficiently compute the index.

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