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Invited paper

Social and financial efficiency of Islamic microfinance institutions: A Data Envelopment Analysis application

Indra Widiarto, Ali Emrouznejad*

Operations & Information Management Group, Aston Business School, Aston University, Birmingham, UK

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ABSTRACT

Microfinance has been developed as alternative solution for global poverty alleviation effort in the last 30 years. Microfinance institution (MFI) has unique characteristic wherein they face double bottom line objectives of outreach to the poor and financial sustainability. This study proposes a two-stage analysis to measure Islamic Microfinance institutions (IMFIs) performance by comparing them to conventional MFIs. First, we develop a Data Envelopment Analysis (DEA) framework to measure MFIs' efficiency in its double bottom line objectives, i.e. in terms of social and financial efficiency. In the second stage non-parametric tests are used to compare the performance and identify factors that contribute to the efficiency of IMFIs and MFIs.

1. Introduction

Microfinance has been one of the solutions prescribed for global poverty alleviation over the past three decades [50,76]. It has since achieved substantial attention and focus, particularly in achieving the Millennium Development Goals (MDG) of halving global poverty in 2015 [7]. It addresses formal banking system failure in eradicating vicious circle of poverty [15,20] by extending financing to the poor, or 'the unbankable' [79] who are deemed too risky thus excluded by formal banking [29,88]. Furthermore, small loans that they demanded are considered unprofitable [47].

Ironically, microfinance institutions (MFIs) charge high interest rates; mostly even much higher than banks owing to high costs incurred from relatively small loan [2,31,61,66], subjected them to criticism [25]. Moreover, MFIs face difficulty penetrating into regions with substantial Muslim population observing religious prohibition of interest [84,86], creating unmet demands for financing among the poor therein [72]. Thus, Islamic microfinance concept had been developed as alternative for Muslim borrowers; based on Islamic financial contracts [48].

Nevertheless, the yardstick of microfinance success lies in its actual performance versus its *raison d'être* of poverty alleviation, i.e. 'the extent to which it alleviates poverty levels of its existing and potential customers' [58]; p. 173). Specifically, MFIs are different from traditional financial institutions due to existence of double bottom line objectives of outreach and financial sustainability [85], i.e. aiding the poorest out of poverty whilst striving to sustain operation for long term. Thus, both outreach and financial sustainability are MFIs' objectives [1,45,88] and likewise becoming standard on which their performance is judged [93].

Whilst IMFIs starting to play instrumental part in Muslim-populated regions in Asia, Africa, Central Europe and Middle East and North Africa [48,62,64], there are very scant, if any, comprehensive empirical studies assessing their actual performance relative to dual objectives. Given its potential, comprehensive empirical study is dreadfully needed to assess IMFI performance vis-à-vis double bottom objectives and to compare them against conventional MFI counterparts; assessing its viability as alternative in poverty alleviation to gain wider support from governments and donors.

This study thus proposes relative efficiency as a performance criterion that can be applied equally to measure overall, social and financial aspects of MFI performance [7]. Specifically, this study proposes the use of Data Envelopment Analysis (DEA), a non-parametric linear programming-based efficiency analysis. It constructed a piece-wise frontier from all best-performing MFIs; thereafter individual MFI's relative efficiency is calculated against MFI(s) with similar characteristics/attributes located in the frontier as its benchmark(s). From efficiency perspective, an MFI must strive for efficiency in its social and financial objectives. DEA enables different specifications to measure overall efficiency, social efficiency and financial efficiency [40].

* Corresponding author.
E-mail address: a.emrouznejad@aston.ac.uk (A. Emrouznejad).

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This research seeks to contribute towards microfinance and Islamic microfinance studies, particularly in currently limited empirical studies in Islamic microfinance performance, as well as towards DEA literatures in application of DEA as an adept methodology in microfinance performance assessment. Finally, this study serves as reflection and wake-up call to IMFIs to improve future performance thus contributing towards the development of Islamic microfinance.

The rest of the paper is organised as follows: next section provides general background on microfinance, i.e. conventional and Islamic MFIs concept differences, MFI operational objectives, and application of efficiency as performance measures. Section 3 explores conceptual framework for efficiency measurement and DEA, further described in Section 4 with DEA specifications used in this study. Dataset is laid out in Section 5 and subsequently followed by first-stage and second-stage analysis in Sections 6 and 7, respectively. Results from these analyses are discussed in Section 8 with direction for further research is proposed in Section 9.

2. Microfinance

2.1. Microfinance and Islamic microfinance

The main role of MFI is expanding economic opportunity and financial market to the poor [27,74,73,92], which is considered as effective solution in achieving poverty reduction and other socio-economic benefits [52]. The underlying assumption being that among causes of poverty is lack of economic opportunities, which can be bridged by microfinance [19] since it is regarded as capable method to assist in distribution of income support and in creation of income-generating activities [31].

Yet, relatively small loans extended by MFIs incur similar transaction costs with large loans, which increase further when MFIs target poor borrowers due to three factors: small amounts, location of poor borrowers and group-lending method to mitigate credit risks hence high fixed costs [31]. High interest rates is thus charged to cover these transaction costs [13,21,81,89] with justification that borrowers return is high in percentage terms thus paying for high interest rates is not perceived as harmful for the borrowers [37,62].

Nevertheless, high interest rate is argued to be problematic. It is documented that high interest rates combined with over-indebtedness and loan misuse often eventually led to excesses ranging from borrowers caught in spiralling debt [43], resulted in poor borrowers selling whatever asset they have [64] to the extreme cases of microfinance-linked suicides in Andhra Pradesh, India in 2010 [21,87] and in Sri Lanka [63]. Adverse selection increases whereby customers borrow without intention to repay [31]. Moreover, MFI operatives often found acting equivalent to loan shark in boosting repayment [75]. This study concurs with [5] that poor borrowers will not be able to pay continuous high interest in long term.

Islamic microfinance concept was later developed as alternative in regions with substantial Muslim population observing faith-based prohibition of interest. It aims to provide better model in addressing embedded issues of high interest rate and others in mainstream/conventional microfinance [2,3]. Employing interest-free contracts, Islamic microfinance institution (IMFI) theoretically extends in-kind, in lieu of monetary, assistance to the poor thereby overcoming misuse and over-indebtedness [2,61]. Islamic microfinance broadens concept of microcredit-cum-trainings by incorporating charity in financing, in the form of *zakah* (alms) and *waqf* (endowment), assisting the poorest in basic necessities and avoiding misuse of productive loans into consumption purposes [3,91]. Although relatively small in scale, Islamic microfinance has grown globally following the growth of wider Islamic finance industry [48].

2.2. Microfinance and double bottom line objectives

Outreach and sustainability are dual objectives of MFI operation [85]. Outreach is defined as social value of MFI output in six aspects, i.e. depth, breadth, length, scope, worth of users, and cost to users [59,70]. These aspects are the defined as the following: *depth of outreach* is defined as the extent to which MFI penetrate deeper to the poorest, *breadth* is measured by number of borrowers assisted, *length* is the duration of microfinance service delivered to a community, *scope of outreach* refers to number of services variety provided (e.g. loan, savings and others), *worth of users* is how much clients value the service provided based on how it matches clients' needs, and *cost to users* is calculated by the total costs clients have to pay for the service as the sum of price costs (interest and fee) and transaction costs. Among these aspects, the focus on outreach in most studies is on the depth and breadth of outreach [65]. On the other hand, sustainability is defined as permanence or the MFI ability to sustain its microcredit and other operations as a viable financial institution [28,59]. This is equally important as MFI is expected to operate in long term to have profound impact on the poor [7,65].

[56] observed that MFIs' sound financial performance does not guarantee depth of outreach, let alone poverty alleviation; whilst [59] examined that MFIs serve households that are either just below the poverty line – 'the richest of the poor' – or just above the poverty line – 'the poorest of the rich' – in its strive to be profitable. Ref. [70] concluded that the depth of outreach and financial sustainability are like conflicting objectives thus a trade-off exists: outreach is only attained by sacrificing financial sustainability or by relying more on donations or subsidies. He suggested MFIs to strive for breadth, scope and length aspects of outreach instead of depth. Studies by Refs. [45,46,54,90] and others also focused on this trade-off.

Ref. [28] suggested that MFIs can sustain their profitability by not lending the poorest, given higher cost per dollar of loan, but to the 'less poor' instead as overall welfare will improve. Yet, this study argued along with [2]; that microfinance is actually a response to the failure of trickle-down development policy to alleviate poverty in most developing countries, owing to asymmetric information.

Ref. [78] argued that MFI can and should manage this objectives trade-off. Paxton and Cuevas (2002) cited in ([65]:3422) argued that, contrary to [31]; group loan schemes actually reduce costs in lending small loans hence trade-off is managed.Ref. [80] supported this view since similar structure of small loans minimises costs. Regarding breadth versus depth of outreach, [65] argued that the rapid growth of microfinance in the past two decades has spurred the growth in number of borrowers both at the industry and at the firm level yet this does not necessarily means reaching out to the poorest, as also found by Ref. [59]. Since helping the poorest is *raison d'être* of microfinance, the depth of outreach, which is generally measured using proxy of average loan balance per borrower, can be regarded as measure for quality of outreach whilst breadth of outreach represents quantity in outreach [65]. Thus, studies concerned with outreach to the poorest have focus on both; as in Refs. [4,58,77]. Furthermore, [38,40,41] among others, empirically observed that both outreach and financial sustainability can be pursued in best-practice MFIs.

2.3. Efficiency as a measure of MFI performance

Traditional financial indicators are not sufficient to assess microfinance performance since, due to its social mission, sustainability in MFI is not necessarily limited to profitability but