

## Microcredit supply under Islamic Banking in Khartoum State, Sudan

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### ABSTRACT

This study analysed the perceived supply-demand gap and determinants of microcredit supply to micro and small enterprises under the Islamic finance system in Khartoum State of Sudan. Results indicate that low participation, reflecting critical constraints on demand, rather than a gap in supply of microcredit is the issue to be addressed. The study also shows a big bias in the provision of microcredit towards non-farm activities, representing an important challenge, particularly facing small-scale farmers in the rain-fed sector, who unlike farmers in the irrigation sector, have no access to alternative credit systems. Other biases in microcredit supply towards larger size, more skilled, higher asset endowed and higher income status micro and small enterprise firms, which seem to correlate with and reflect better collateral and repayment abilities, are also revealed. The study identified a number of institutional and policy reform measures to balance such biases and improve access to and provision of microcredit to relatively smaller, less asset, income and skill endowed micro and small enterprises' operators, particularly dry land farmers and those migrating from relatively remote geographic regions with lower social networks and connections in Khartoum State.

**Key words:** Islamic financing; micro and small enterprises; microcredit; Heckman selection model; Sudan

### Introduction

One of the major developments in both Muslim and non-Muslim countries in the last two decades has been the emergence of Islamic banks. Sudan is one of three

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countries (the others are Iran and Pakistan) where the whole banking system has been converted to Islamic banks. Islamic financing, all over the Islamic world, is thought of and accepted based on religious ideological reasoning and belief in Islam (e.g. an act of faith). Although a great deal is known about the Islamic approach to financing in general, little is known regarding its practical application, particularly in the case of providing credit to medium and small enterprises (MSEs).

Sudan's credit market consists of formal and semi-formal sources. The semi-formal microfinance institutions mainly rely on foreign donations and hence have been negatively impacted by the financial sanctions imposed on Sudan since 1997 and hence operate at a limited scale. Some other non-governmental organisations (NGOs) and social programmes are currently undertaking microfinance operations in the country, but their outreach remains weak (Abukasawi 2011).

For more integration of microfinance into the commercial banks, the Central Bank of Sudan (CBS) launched a microfinance strategy in early 2007 and established a microfinance unit (MFU) fully responsible for executing the strategy. The strategy directed all commercial banks to allocate a minimum of 12% of their portfolio to microfinance lending (CBS 2007). This policy was expected to result in more efficient financial intermediation and improve access to loanable funds for MSEs. Nevertheless, microcredit provision in Sudan until June 2014 remained below 5% of the total lending portfolio of most banks except for very few specialised in microcredit lending (Abukasawi & Widad 2014).

The main conclusion of several studies commissioned by the CBS was that there is a large microcredit supply-demand gap in many regions in Sudan. Most of the MSEs surveyed described microfinance offered by banks as inadequate and unaffordable and as a result most of the microcredit services take place within the informal sector (UNICONS 2006; UNICONS 2013; UNDP and UNHCR 2009; UNDP, TUFTS and IOM 2010).

Although the mentioned studies have provided useful information about the industry, important issues for appropriate policy design and institutional interventions have not been addressed (Abukasawi & Widad 2014; Badr El Din 2003). For instance, the existing studies have not analysed the perceived gap between supply and demand of formal microcredit to small-scale enterprises and the size of that gap. Also, these studies have not conducted comparisons between farm-related and non-farm activities as well as among various borrower groups to identify biases in existing microcredit practices that need to be corrected. Moreover, the said studies have not investigated and empirically measured and tested hypotheses about influences of key factors on banks' decision to provide microcredit and the amount to be provided to MSEs under the new Islamic system. The present study intends to contribute to

bridging this knowledge gap by conducting an analysis of the size of the perceived gap between supply of and demand for formal microcredit by borrower groups (micro versus small, urban versus rural, male versus female operators, region of home origin, etc.), including a comparative assessment of farm versus non-farm-related activities. In addition, the paper makes an attempt to measure influences of factors on both the decision to approve and intensity of approval (level) of formal microcredit to MSE owners in Khartoum State, Sudan under the current Islamic lending formulae.

The next section provides an overview of Islamic banking and finance to MSEs. Section 3 describes the case study area and methods and sources of the data. Section 4 provides the conceptual framework and section 5 analyses the extent and distribution of the current supply-demand gap borne by various borrower groups. Section 6 compares the state of microfinance provision to farm-related with non-farm-related activities. Section 7 conducts the empirical analysis of determinants of microcredit supply under the currently practiced Islamic lending regimes. Section 8 presents the results of the empirical estimation and the final section concludes providing some policy implications and recommendations.

### Islamic banking and rules to MSE finance

The Islamic financing system has been introduced in all financial institutions in Sudan since the early 1980s. Prohibition of collection of interest (usury), referred to in Arabic language as “Riba”<sup>1</sup> is the most significant principle of Islamic finance. Loans provided by banks in Sudan are distributed between three main Islamic formulae: Murabaha, Musharaka and Mudaraba, briefly described below.

**A. Murabaha (Cost-Plus-Mark-up).** Within a Murabaha contract, the financial institution agrees to fund the purchase of a given asset or good from a third party at the request of its client and then re-sells it to its client at a mark-up profit. While the Islamic model avoids direct lending of money, it is similar to the conventional interest-based Western lending concept. However, in theory, the mark-up profit is different in many respects. The mark-up is for the services provided by the financial institution, namely, seeking out, locating and purchasing the required goods at the best price. As the bank buys, and then sells to the client, a commodity that he has asked for in connection with his business, the operation is not a mere exchange of money for money. Murabaha is therefore considered similar to the case where a commodity offered for sale on credit fetches a higher price than when it was originally offered for cash. Murabaha enables small and micro-enterprises to finance purchases of raw materials and/or fixed assets with deferred payments (Badr El Din 2003). Absence of any “compounding” possibility with Murabaha profit rates is another major

difference between conventional lending and Murabaha financing (Kholis 2008). It is empirically established that Murabaha tops the list of the available modes of Islamic finance in terms of popularity worldwide (Choudhury 2001; Ahmed 2008). Murabaha comes quite close to conventional lending and therefore it is easy to adopt by conventional bankers venturing into Islamic finance. It is also simple and easy to implement. Like conventional lending, however, the Murabaha contract requires the MSE operator to provide security (collateral and/or guarantees).

**B. Mudaraba (Trust Financing).** Mudaraba is a form of partnership in which one partner provides the capital required for funding a project, while the other party manages the investment using his or her expertise (Mudarib). Profits arising from the investment are distributed according to a fixed, pre-determined ratio. The loss in a Mudaraba contract is borne by the capital-provider unless it was due to the negligence, misconduct or violation of the conditions pre-agreed upon by the capital provider. Management of the investment is the sole responsibility of the Mudarib, and all assets acquired by him or her are the sole possession of the financier. This contract requires a great deal of confidence between the two parties and that is why it is very rarely used worldwide (Adnan & Muhamad 2007; Ahmed 2008).

**C. Musharaka (Partnership Financing/Profit and Loss Sharing).** The Musharaka contract is very similar to the Mudaraba contract, but it is different in that all parties involved provide capital towards financing of the investment. Profits are shared between partners on a preagreed ratio, but losses will be shared in proportion to capital shares invested by each party. This gives an incentive to invest wisely and to take an active interest in the investment. An important feature of the Musharaka contract is that it does not require the partner to present securities against possible losses (Badr El Din 2003).

In a Musharaka, the distribution of profit is made once, at the time of liquidation, whereas in conventional partnerships, net income is distributed periodically among partners while the project is still in operation. It is believed that the Profit and Loss Sharing (PLS) system of Musharaka financing has many advantages to offer to MSEs in Sudan. In addition to its being a flexible and easily understandable form of financing, it caters for both production and management, thus leading to increased income opportunities for those who do not own capital (CBS 2007).

A study by Ahmed (2008), however, suggests that the need of MSEs for long-term finance by Musharaka contract involves a major dilemma facing the Sudanese Islamic banks, and hence recommend the use of group lending arrangements within the Musharaka mode to finance MSEs (Ahmed 2008). The fact that many MSE operators do not have adequate bookkeeping records is considered to be a major reason behind the reluctance of financiers to enter into partnerships to avoid exposure to

moral hazard problems, as clients may conceal profits or engage in other undeclared activities with additional risks and losses (Abou-Gabal et al. 2011).

### **Research methodology: The case study area and sources and methods of data collection**

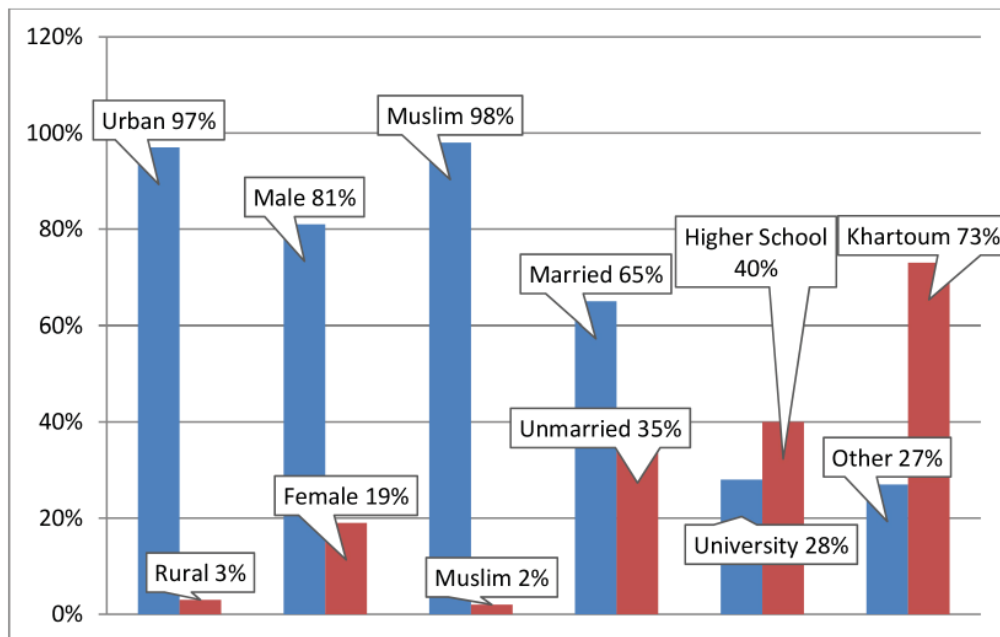
The Khartoum State has been chosen as the case study area as it is currently the focal area of microcredit activities. Khartoum State is also where Sudan's capital is located and where commercial, industrial and financial institutions and activities are concentrated (CBS 2014). This study used cross-section survey data collected from a sample of 690 MSEs in three areas of Khartoum State during 2013. Stratified multi-stage sampling was employed to select the survey sample from the target population of MSEs, which was stratified by attributes considered of high relevance to key determinants of microcredit demand and supply. Location of the business was one key access and proximity factor and the population was accordingly stratified by location to represent MSEs operating in the three main areas of the state (Khartoum, Oumdurman, Khartoum North). Localities within each area were then stratified into rural and urban groups to select a sub-sample from each in stage two. In the third stage, each sub-group was further stratified by type of business (trade, services, etc.) being another key determinant of demand for microcredit. MSEs within each location-business type substrata were further divided by size of the business (micro and small). To adequately represent these groups, a sub-sample was selected from each location-business type-size group.

The survey used structured questionnaires administered through direct interviews with the selected respondents. The questionnaire contained detailed information on the geographic, demographic and socioeconomic attributes of the MSE owners such as gender, age and education. Collected data also included information on characteristics of the firm such as the type, size and location of the business in addition to lender-related attributes such as collateral and interest charges. Secondary data were also collected from banks providing microcredit in the three areas of the state. The banks' survey did not utilise questionnaires but was based on compilation of unpublished reports and interviews with key informants from bank officials.

The MSEs' survey revealed that the population of MSEs in the study area is male dominated (81%) and predominantly Muslims (98.2%) (Figure 1). About two thirds (65%) of the respondents are married while unmarried singles form the bulk (30%) of the rest. Education levels among MSE owners in the study area appear high as above 80% of them received some education dominated by those who completed secondary school education (40%) followed by university graduates (28%). Less than

one third of those operating MSEs in Khartoum State came from within the state (27%) or from neighbouring states (Central 26% and Northern 13%) while about a quarter came from states to the western borders of the country (Kordofan 16% and Darfur 11%).

Trade (mainly retailing activities, e.g. street vendors, small grocery shops, etc.) appears to be the dominant activity of MSEs in both urban and rural areas (73% and 71%, respectively). None of the rural MSEs are engaged in services (e.g. small restaurants and food and tea vending, small local transport, small mechanical and other repairs and maintenance workshops, barber, tailor, etc.). However, more MSEs are involved in artisanal production activities (e.g. carpentry, handicrafts, shoemaking, etc.) in rural (29%) than in urban areas (8%). Farming activities (primarily involving production and sale of poultry and dairy products of small-scale farms in more rural like (peri-urban) settings neighbouring Khartoum City) constitute only about 2% of the total sample size.



**Figure 1:** Socioeconomic attributes of surveyed MSEs in Khartoum State (2013)

### Conceptual framework of formal microcredit to micro and small enterprises in Sudan

This study is conceptually based on the pioneering work of Stiglitz and Weiss (1981) on credit rationing, which points out that interest rates charged by a credit

institution play a dual role of selecting potential borrowers (adverse selection) and affecting borrowers behaviour (incentive effect). Both effects derive directly from the residual imperfect information, which is present in loan markets after banks have evaluated loan applications; the banks do not have complete information on their borrowers. When the loan price (rate of interest) affects the nature of transactions, market equilibrium may not occur where demand and supply are equal. Different borrowers have different probabilities of repaying their loans and the expected return to the bank depends on the probability of repayment. It is difficult for a bank to identify borrowers who are more likely to repay. Thus, a bank uses a variety of screening devices, one of which is the interest rate (Stiglitz & Weiss 1981).

Credit rationing occurs when potential borrowers' application for loans from formal credit sources are either denied or partially supported. This defines the gap between demand for and supply of credit. Information on size of the loan applied for and actual credit received will be used to estimate the credit gap in this study.

### **The current supply-demand gap among various borrower groups in Khartoum State**

MSEs' survey results reported in Table 1 below show that the rate of approval for those who applied for loans was very high as 85.5% of all the applications submitted for microcredit loans were approved (% received loans column). This may be considered to suggest that there is no large gap between demand for and supply of microcredit in terms of the number of applications approved. However, this should be evaluated against the very low application rate as only 24% of the surveyed MSEs reported applying for microcredit loans. All MSE owners who applied for microcredit indicated that they prefer the Murabaha Islamic contract to Musharka (PLS) because it is more understandable and less costly. Also, almost all banks providing microcredit in the state surveyed stated that they prefer Murabaha because it is less risky and costly, easier to process and clients can easily be monitored. This confirms the findings of Abukasawi (2011), which showed that Murabaha is the most commonly used mode of finance by all commercial banks in Sudan and constitutes 97% of banks' total lending size. It is also in agreement with the above reviewed literature on Islamic banking worldwide.

Some interesting variations, however, have been observed in both participation (demand) and approval (supply) between different categories of borrowers. The fact that close to 100% of both the applicants and the recipients were from an urban group is not surprising, given that the surveyed population and the study area (Khartoum State) is primarily urban. The MSEs' survey results nevertheless indicate

a high approval rate of 67% of applications received from rural-based MSEs. MSEs engaged in trade represent the main users and recipients of microcredit in the state (more than 70% of all the applications). The approval rates for other types of MSEs (production and services), however, are comparably high at more than 80%. Although no significant difference was found between rates of application between farm-related and non-farm-related activities, results indicate higher approval rate among nonfarm activities (85.8%) compared to (66.6%) among farm activities. While the number of applicants and recipients is about equally split between MSE owners whose home origin is from within and from outside Khartoum, those from within the state have higher approval rates (92%) compared to 80% for those from outside the state.

While many more applications are received from the small compared to the micro MSEs, the gap in the approval rates between the two is not large. A similar story prevails among male and female owners of MSEs. These results suggest that although, in general, there seem to be no clear biases in approval rates among the various groups, the problem of low participation appears to be bigger among the female and micro owners as well as those whose home origin is outside the state.

**Table 1:** Sample estimates of demand for and supply of loans and size of supply-demand gap by borrower group in Khartoum State, Sudan

Borrower group	Demand		Supply		% Received
	No of applicants	% Share of applications	No of recipients	% Share of applications	
		<b>Size of business</b>			
Micro	66	40	53	37.6	80.3
Small	99	60	88	62.4	88.9
Total	165	100	141	100	NA
		<b>Gender</b>			
Female	46	27.9	43	30.5	93.5
Male	119	72.1	98	69.5	82.4
Total	165	100	141	100	NA
		<b>Type of activity</b>			
Trade	122	73.9	107	75.9	87.7
Production	17	10.3	14	9.9	82.4
Services	26	15.8	20	14.2	76.9
Total	165	100	141	100	NA



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		<b>Home origin</b>			
Khartoum State	74	44.8	68	48.2	91.9
Other states	91	55.2	73	51.8	80.2
Total	165	100	141	100	NA
		<b>Mode of living</b>			
Rural	3	1.8	2	1.4	66.7
Urban	162	98.2	139	98.6	85.8
Total	165	100	141	100	NA

Source: Micro and small enterprises survey data (2013)

The same pattern was also observed when one works with the amounts rather than the number of applications, again emphasising the point that the main source of the hidden gap and variations come from the low participation rates (the proportion of MSEs applying for microcredit). This confirms results of other studies which found that market penetration of formal microcredit lending in the urban sections of Khartoum State has not exceeded 8% of the total potential market demand estimated at 1.5 million clients (PlaNNet Finance 2007).

### Providing microcredit to agricultural activities

Survey results reported in Table 2 below show that, as expected, farm activities are concentrated in the rural areas (69.2%) compared to the urban areas (30.8%). While trade dominates activities of both farm-related and non-farm-related MSEs, more farmers are engaged in production activities (15%) compared to non-farm MSEs (8%). The use of loans among farm-related activities is entirely focused on financing raw materials (100%), compared to non-farm MSEs (61%). That means farmers mainly borrow to buy inputs whereas many non-farm MSEs use microcredit for other purposes such as investing in buying assets (39%).

**Table 2:** Farm-related and non-farm-related attributes of borrower groups in Khartoum State, Sudan

<b>Attribute</b>	<b>Farm-related activities (%)</b>	<b>Non-farm-related activities (%)</b>	<b>Total (%)</b>
1. Type of business activity:			
Production	1.78% (15.39%)	98.22% (08.28%)	100
Trade	3.45% (69.23%)	96.55% (73.26%)	100
Service	1.57 (15.38)	98.43 (18,46)	100
Total	NA (100%)	NA (100%)	
2. Mode of living:			
Rural	69.23%	01.77%	NA
Urban	30.77%	98.23%	NA
Total	100%	100%	
3. Application and approval:			
Applied	23.08%	23.93%	NA
Did not apply	76.92%	76.07%	NA
Total	100%	100%	
Received	66.60%	85.80%	NA
Did not receive	33.40%	14.20%	NA
Total	100%	100%	
4. Use of loan:			
Financing assets	0%	10.8%	NA
Financing raw materials	100%	61.1%	NA
Financing assets & raw materials	0%	23.7%	NA
Non-business use	0%	04.4%	NA
Total	100%	100%	

Source: Micro and small enterprises survey data (2013)

Although no significant difference was found between rates of application for loans for farm and non-farm activities, results indicate higher approval rates among non-farm activities (85.8%) compared to farm activities (66.6%) in Khartoum State (table 2). This is due to the fact that Khartoum State is a predominantly urban state where non-farm activities, particularly artisanal trade and services, concentrate and hence are the focus of lending by commercial banks. Data acquired from credit suppliers also indicate that the share of MSEs engaged in farming in total micro financial flows in the whole country, including the many other states outside Khartoum (where the bulk of agriculture is found), remains very small (less than 5%). This is a major issue and key obstacle facing small-scale farmers, particularly in the rain-fed sector. While the majority of small farmers in the main irrigation schemes in the country have access to credit through alternative tenure systems under crop-sharing and tenancy arrangements, no similar mechanisms are available to their counterparts

in the dry land sector. Basically all credit goes to large-scale mechanised farms in the dry land sector through the Agricultural Bank of Sudan (ABS), which was historically created for this purpose.

To address this gap, the ABS launched a microfinance initiative (ABSUMI) in partnership with the CBS and the International Fund for Agricultural Development (IFAD) with special focus on providing credit to small-scale farmers and pastoralists in rural areas. The initiative was launched in 2011, aiming to reach one million families in ten states within ten years (IFAD 2012). The project was designed to provide microfinance to farmers, particularly female-headed farming families engaged in activities such as fattening of animals, smallscale cultivation and other farm-related income-generating activities. During its pilot phase, the project provided funding for 11,988 households organised in 677 women's groups at a size of 13 million Sudanese pounds-SDG (\$13 million) (IFAD 2012). In 2014, the project provided microcredit to 25,000 female farmers in five states in the amount of SDG 39 million (US \$6.8 million). This project has also achieved a repayment rate of 100% and a savings component which amounted to more than three million SDG (\$250,000) by 2014 (CBS 2014). This remarkable expansion is a result of the success of the pilot phase as well as the enthusiasm of partners to meet the shortfall between demand and supply in the microfinance outreach in the rural areas of the country (CBS 2014).

The Musharaka contract is the most common mode of finance for farming activities. This is a reflection of its suitability for provision of credit to small farmers whose only asset is their piece of land they are willing to place under such partnership (CBS 2014).

### **The empirical model employed to analyse determinants of micro-credit supply under Sudan's Islamic finance regimes**

One of the main objectives of this study is to identify and analyse the determinants of the decision to provide credit and the amount of credit to be provided in formal microcredit markets in Sudan. The credit supply decisions considered in this study include:

- (a) Has the loan application been successful (approved) or not?
- (b) If successful, what was the size of the loan approved?

This sequence of decisions have been modelled and analysed in many ways in the literature. This study adopted the two-step selection model of Heckman (1976), which is common in microcredit supply studies (Quoc et al. 2012; Okurut 2006; Agier & Szafarz 2011) to analyse determinants of the decision questions 1 and 2 (i.e. approval and amount approved).

A probit model is typically employed for the first stage estimation of determinants of the probability to provide a loan or not (decision 1) and a Tobit model then estimates the effects of the factors influencing the amount (how much?) provided in stage two. The two-step Heckman selection analytical framework is implemented in the empirical analyses as specified below:

$$P_i = \delta Z_i + \varepsilon_i \quad E(\varepsilon_i / z) = 0 \quad (1)$$

This defines the probit model for step 1 (estimation of the determinants of the probability of approval of microcredit by providers), where  $P_i$  is the choice (selection) dummy for the approval of formal microcredit,  $Z_i$  is a vector of variables that influence the approval decision,  $\delta$  estimates the model parameters and  $\varepsilon_i$  is the error term.

In step 2, we estimate the outcome equation explaining the level of approval (i.e. the amount of loan approved):

$$Y_i = \beta X_i + \mu_i \quad E(\mu_i / X) = 0 \quad (2)$$

$Y_i$  measures the amount of credit approved,  $X_i$  is a vector of explanatory variables,  $\beta$  is the vector of parameter estimates and  $\mu_i$  is the error term. The model assumes that  $Z$  and  $X$  are observable exogenous variables and  $X$  is a subset of  $Z$ . A non-zero correlation between  $\varepsilon_i$  and  $\mu_i$  implies a Heckman selection bias problem to be corrected for using the inverse Mills ratio (IMR) (Greene 2000).

The above empirical model was fitted to data collected from surveys of MSEs. A number of explanatory variables (i.e. individual-related, business-related and lender-related variables) has been identified in the relevant literature as key factors of the approval and level of approval of microcredit for households and small-scale enterprise owners (Laha 2014; Sebu 2013; Quac et al. 2012). Information on supply factors included profit margins (reflecting cost to borrow), but the difference between margins charged by different providers of microcredit in the state was negligible and hence this factor was not included in our analyses. Information collected on banks' requirements for approval of applications indicate that a feasibility study containing details of the intended investment (e.g. initial capital, expected return, etc.) and the applicant's financial and business status (e.g. other sources of income, value of assets owned, household expenditure, etc.) need to be provided for evaluating the eligibility for lending.

A key requirement is the collateral security, which varies from bank to bank according to the nature of the loan in question. Banks, however, do not disclose such information about their clients and hence the study had to rely on information

collected from the primary MSE owners' survey of relevance to the collateral factor. Information on attributes such as ownership of dwelling, value of assets, profit from and expenditure on business, legal status, size and age of the business, training on business, awareness of formal microcredit service, awareness of the Murabaha contract and ability to provide collateral were tested as proxies to the collateral requirements' effect. Other MSE owners' attributes considered as explanatory variables included the age, gender, marital status, and educational level of the MSE operator, as well as the family size, ethnic group, household income and expenditure, type of activity, and distance from the nearest bank.

## Results and discussion of the empirical estimation

Parameter estimates of the Heckman two-step selection procedure were used to compute the marginal effects of the included determinants. The estimation results and their implications for microfinance policy and practice in Sudan are presented in the following sections.

### Factors influencing the formal lenders' decision to provide microcredit

The probit model employed for estimating parameters of the determinants of microcredit approval in the first step performed very well with statistically significant error term statistics. The model has been checked for multicollinearity with test results for a Variance Inflation Factor (VIF) of 1.19 indicating no multicollinearity problem. The marginal effects of many key explanatory variables were statistically significant as indicated in Table 3 below. The signs on the estimated parameters seem to be consistent with expectations on direction of the effects found in the literature as discussed below.

One interesting result is the apparent bias of microcredit suppliers in favour of female-owned enterprises as the probability of women being approved for formal microcredit is 50% higher than men. This could possibly be due to the fact that banks consider women to be trustworthy, as they fear default penalties more than men (i.e. more risk averse) (Sebu 2013). Awareness of the Murabaha mode of finance appears to have a highly significant positive influence on approval, suggesting that those aware of this system are familiar with the terms and conditions of loan approval and hence are able to meet the formal bank requirements. Related to this is the finding that the probability of MSEs owners who are members of a social group being approved for formal microcredit is 32% higher than those who are not. This seems to suggest that banks perceive social networks as information sharing facilitators assisting many MSEs owners to have better understanding of the rules and procedures. It may also be

because information networks act as a screening mechanism where potential clients are asked to be recommended, or guaranteed by existing clients, thereby acting as social collateral (Quoc et al. 2012; Vaessen 2001).

One key business related attribute is training on business management, the effect of which was found to be positive, implying that banks have a positive perception of those who received training and consider them possessing the necessary knowledge to run viable businesses and manage business risk. The study found that the probability of microcredit approval among those who maintain accounting records is 36% higher than among those who do not, indicating that formal lenders consider applicants with better business knowledge and managerial skills to be more capable of securing collateral as well as timely repayment. This is in line with the results from Aga and Reilly (2011), Mira and Kennedy (2013), Avortri et al. (2013), Nanagaki et al. (2014) and Eije et al. (2002).

The probability of MSE owners whose home origin is Khartoum State being approved is 29% higher than for those coming from other parts of the country. This may be due to the high repayment rates reported in the survey among those from Khartoum (48%) compared to others.

Another factor could be the fact that those from within Khartoum State have better access and personal knowledge of the banks' staff, who naturally would be residents of Khartoum city also suggesting stronger social networks with the banking sector. Related to this is the location of the business (ZONE) as the study revealed that the probability of approval among those whose businesses are located in Khartoum area is 48.8% higher than those whose businesses are located elsewhere. This concurs with results from Okurut (2006) who found the provincial location to have a positive and significant effect on access to formal credit.

**Table 3:** Estimates of marginal effects of Heckman selection equation (probit model) of determinants of approval of formal microcredit to MSEs owners in Khartoum State, Sudan

Variable	Coefficient	Z	P>[z]
Age	0.006	0.04	0.968
Gender	-0.500	-3.03	0.002***
Dwelling	0.276	1.97	0.048**
Family expenditure	-0.000	-2.92	0.004***
Aware of Murabaha	0.726	4.79	0.000*
Number of employees	-0.034	-0.68	0.496
Business records	0.361	2.47	0.014**
Training	0.432	2.85	0.004***

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Variable	Coefficient	Z	P>[z]
Collateral	2.062	4.76	0.000*
Extra income	0.422	2.81	0.005***
Social group	0.321	2.44	0.015**
Zone	0.486	3.56	0.000*
Education	-0.036	-0.95	0.344
Rural/urban	-0.279	-0.61	0.539
Business profit	-9.630	-1.11	0.265
Value of assets	0.000	1.78	0.076*
Marital status	-0.030	-0.21	0.832
Duration in business	-0.044	-1.24	0.216
Legal status	0.081	0.54	0.586
Type of activity	0.121	0.81	0.416
Home origin	0.295	2.05	0.041**
Cons	-3.203	-6.03	0.000
Mills lambda	2512.012	1.30	0.194
Rho	0.414		
Sigma	6060.783		
No of observations	687	Waldchi2(11) 40.64	
Censored observations	524	Prob.>chi2 0.00	
Uncensored observations	163		

\*\*\*, \*\*, \* denote significance at 1%, 5% and 10% respectively

Results indicate that the probability that MSE owners who have other sources of income (e.g. wages from another job, money transfers from the relatives, pension, etc.) are more likely to be approved for formal microcredit than for those who do not. This may imply that with additional and diverse sources of income, banks view an MSE owner to be more capable of repaying dues, which is consistent with results from Vaessen (2001) and Awunyo-Vitor et al. (2014). Related to having an extra source of income is the amount of family expenditure, which was found to have a statistically significant negative effect on approval, implying that lenders view applicants with high levels of expenditure as having less ability to save and repay (Okurut & Schoombee 2007).

As expected and widely held in the literature (Fatoki & Smit 2011; Tadesse 2014; Dutta & Magableh 2006; Essien & Arene 2014; Mira & Kennedy 2013), the ability to provide collateral was found to have a highly significant positive influence on the success in acquiring microcredit. Another factor closely linked to the collateral requirement is the value of assets owned (particularly ownership of a dwelling), which

were found to be of high significant positive influence on approval. Similar findings are reached by Quoc et al. (2012) and Dutta and Magableh (2006). It is expected that formal lenders are more inclined to favour disbursement of credit to those who own their place of residence, as their property can be used as collateral as well as a sign of the applicant's ability to repay dues. They may also be perceived, with their address known to the lender, to be lower risk clients (Blumberg & Letterie 2008).

Other variables such as level of education, type of activity, months in business, marital status, mode of living (rural/urban), business profit, legal status and age of applicant have shown no statistical significance in influencing the decision to approve microcredit. The coefficient of the inverse Mill's ratio (IMR) in the selection equation was positive but insignificant at 0.194 indicating no sample selection bias in this case.

### Factors influencing the level of approval of microcredit

Results of the Heckman outcome (stage two) Tobit estimation are shown in Table 4. The multicollinearity check for this model shows a VIF of 1.15 indicating no multicollinearity problem. While the household attributes did not seem to have statistically significant influences, a number of key business-related characteristics appear to significantly affect approval levels measured as the amount of microcredit provided (in Sudanese pounds-SDG) to an MSE owner.

Consistent with results of stage 1 (approval) estimation, having extra income from sources other than the main MSE in question, value of assets owned and keeping accounting records appear to have a significant positive effect on the level of microcredit approval. The study results also seem to suggest that as the business size increases, the loan amount approved also increases. A small firm is larger than a micro one in terms of working capital, assets and in most cases the number of employees, and hence banks may consider approving larger amounts for larger enterprises to enable them to meet their larger capital needs. This result concurs with findings from Laha (2014).

Other variables such as gender, owning a house, location of business, home origin, family expenditure and awareness of Murabaha have shown no statistical significance in influencing the level of microcredit approved.



**Table 4:** Heckman outcome equation Tobit estimation results for factors influencing the level of loan approval in formal microcredit markets in Khartoum State, Sudan

Variable	Coefficient	Z	P>{ z }
Gender	73.354	0.06	0.954
Value of assets	0.190	1.97	0.049**
Household expenditure	-0.135	-1.56	0.119
Extra income	2244.904	1.94	0.052*
Dwelling	543.194	0.45	0.651
Size of business	3140.983	2.93	0.003***
Home of origin	29.924	0.03	0.978
Zone	1249.546	1.11	0.266
Awareness of Murabaha	522.090	0.29	0.774
Business records	2945.177	2.71	0.007***
Cons.	-1848.327	-0.50	0.619

\*\*\*, \*\*, \* denote significance at 1%, 5% and 10% respectively

## Conclusions and implications of the study

This study analysed various aspects of credit supply to MSEs under the current Islamic finance regimes in Sudan. One aspect was analysis of the perceived supply demand gap in formal microcredit and the size of that gap. Results of the analysis indicate that the problem is a low participation problem rather than a gap in supply of microcredit. This result seems to point to the fact that the main issue with outreach of microcredit in Sudan is to focus on critically examining and understanding factors behind such low participation rates (demand constraints). Availability of information and awareness about microcredit, particularly the popular Murabaha Islamic mode and providers' efforts to reach out could be key elements, among other factors, to be considered by policy makers.

Study results indicate that microcredit to MSEs under the Islamic finance system in Khartoum State remains biased towards supporting non-farm activities, particularly in the artisanal trade and services subsectors. This is understood in the case of the study area which is predominantly urban and where these activities concentrate more than farming. Nevertheless, our study reveals that this bias is also maintained at the national level, as the share of MSEs engaged in farming in total micro financial flows in the whole country is very small (less than 5%). This continues to present a challenge to providing access to microcredit to small-scale farmers, particularly

in the rain-fed sector, who unlike farmers in the irrigation sector, have no access to credit through alternative systems.

Recent efforts launched by the ABS and partners to address this bias need to be strengthened and expanded. To enable financial inclusion of small farmers, Islamic microfinance products need to be customised to their needs. The Ijara (leasing) (Kamali 2007)<sup>2</sup> and Muzaraa (share cropping) (Yaacob 2013)<sup>3</sup> modes of finance are good examples of such products commonly practiced in a number of Muslim countries (IFAD 2012). Banks can reach small farmers through a series of capacity building projects and developing tools such as group financing, co-operative groups, production-risk guarantees and crop-insurance products aimed at small-scale farmers. Banks can also work with insurance companies to offer insurance products specifically aimed at small-scale farmers. These products need to be coupled with extensive extension programs to educate farmers on the use of micro-insurance.

This study also analysed determinants of the approval and the level of approval (amount) of microcredit to MSEs owners in Khartoum State. While a number of household attributes were found to be important determinants of the decision to approve microcredit, influences of these factors on the amount of credit provided were statistically insignificant in stage two of the Heckman selection estimation. Conversely, a number of key business-related characteristics appear to significantly affect the level of formal microcredit approval. These results have important implications for microcredit policy and suggest various measures and reforms with high potential for enhancing the effectiveness and success of the current Islamic microcredit MSEs in Sudan.

One key finding relates to the positive effect of awareness of the predominant mode of microcredit, confirming the importance of more efforts to improve awareness of Islamic modes of finance particularly the Murabaha contract. Study results suggest that training of MSE owners, like awareness, would contribute to better ability among MSEs operators to assess and manage risks associated with borrowing from formal lenders. The study also confirmed the importance of other key business-related factors such as maintaining accounting records and business size particularly for the level of microcredit provided. Accordingly, efforts and innovative measures to improve managerial skills and financial knowledge of relatively smaller and less equipped firms are needed to reduce the bias towards larger size and better skilled firms in provision of microcredit.

Among the household attributes found to be of significance is the interesting finding on the influence of gender, which revealed that female-owned MSEs are more likely to be approved for microcredit. This could be an indication that the current microcredit suppliers are targeting female MSE owners and suggests the need to

provide the necessary complementary support for strengthening business skills and entrepreneurship of women-managed MSEs. Other important factors include the economic status attributes such as income and value of assets. Results also indicate that MSEs run by households at higher income brackets are more likely to be approved for microcredit as well as for larger amounts. It is accordingly important to introduce measures that target MSEs in the lower economic status segments to empower such target groups through increased awareness of Islamic modes of finance, training and other complementary innovative mechanisms that would improve their managerial ability, collateral and repayment security and effective access to microcredit.

Study results also seem to suggest that while Murabaha appears more attractive for financing MSEs in the non-farm sectors, the Musharaka (PLS) is the most common contract for supporting farming activities. This is a reflection of its suitability for provision of credit to small farmers whose only asset is their piece of land they are willing to place under such partnership. Thus, this study recommends the use of the group lending practice in Musharaka (PLS) financing for both small farmers and MSEs operators. This will reduce the administration burden on the bank staff and provide alternative security against possible client's default. Group collateral would be in the form of security required by the bank against fraud, misconduct and misuse of funds. Monitoring of the group could be undertaken by the group leader in collaboration with the bank staff. The Musharaka contract allows viable and likely profitable projects not to be turned down because of lack of collateral at inception. In this arrangement, both borrower and lender are keen on making the operation a success and hence profits are likely to be higher than expected. It is also a suitable method of funding for small entrepreneurs who own little and have only their skills and efforts to share.

## Endnotes

1. As a Shariah term, Riba refers to the premium that must be paid by the borrower to the lender along with the principal amount, as a condition for the loan or for an extension of its maturity, which today is commonly referred to as interest (named profit margin in Islamic terms).
2. Ijara is an Islamic contract where a lessee approaches a bank with a request to lease a particular asset or property. Under this contract, the lessor buys the asset (property) and enters into a leasing contract with the lessee that specifies the amount and interval of the rental payments to be made by the latter. Ownership of the asset remains with the lessor and so is the obligation to bear the risks associated with ownership rights. Ownership of the asset can be transferred to the lessee after full payment of asset rental (Kamali 2007).

3. Muzaraa is a share-cropping agreement in which one party (e.g. land owner) agrees to allow a portion of her or his land to be used by the other party (laborer) in return for part of the produce of the land (e.g. a third or a quarter of harvest) (Yaacob 2013).

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