



## Historical Incidences of Credit Rationing among Micro and Small Enterprises in Kenya

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### ABSTRACT

In the mid-2000s, the Government of Kenya recognized the existence of institutional barriers preventing micro and small enterprises (MSEs) from directly accessing credit from financial institutions. This development informed the change of lending policy from direct lending to group lending in government supported programmes. However, this change was effected without a comprehensive theoretical and empirical examination of the underlying reasons why MSEs failed to access credit. This study fills this gap by investigating the underlying reasons MSEs were credit rationed in Kenya. The general consensus from this study is that there was a high incidence of credit rationing in Kenya in 1990s and 2000s which stemmed from information asymmetry. The study concludes that the Government's current policy of promoting group lending is indeed workable if the mode can assist in mitigating information asymmetry in credit markets.

**Keywords:** Credit Rationing, Information Asymmetry, Micro and Small Enterprises

**JEL Classifications:** D5, D8

### 1. INTRODUCTION

Given historically low levels of savings in Kenya since independence in 1963 (Kibet et al., 2009), one would have expected external credit to have played a significant role in micro and small enterprise (MSE) development. However, the historical data indicates otherwise - MSEs had low levels of credit access across the country (Central Bureau of Statistics [CBS] et al., 1999). To mitigate this scenario, the Kenyan Government came up with various lending programmes to supplement other financiers in supplying credit to MSEs (Ronge et al., 2002). Initially, most of those programmes lent credit directly to individual MSEs. Ultimately, however, the government recognised the existence of institutional barriers preventing MSEs from directly accessing credit (Government of Kenya [GOK], 2005). The outcome of this realisation led to the government change of lending strategy from individual to group lending in 2006 (Kodongo and Kendi, 2013).

The change in lending policy was effected without a comprehensive theoretical and empirical examination into understanding the

underlying reasons MSEs failed to access credit (GOK, 2005). This study examines the theoretical and empirical basis for the change in credit policy with reference to government supported programmes.

### 2. THE HISTORICAL PROBLEMS OF CREDIT IN THE MSEs IN KENYA

MSEs are viewed as key catalysts of social and economic transformation especially in developing countries (International Finance Corporation [IFC], 2011). In Kenya for instance, in 1990s, they represented the biggest segment of enterprises and generated a significant portion of the country's gross domestic product (CBS et al., 1999). In addition, they formed the backbone of the available employment opportunities alongside promoting proletarian economic augmentation and equitable economic expansion (Pelham, 2000). However, despite their continued acknowledged importance, a generally accepted premise is that MSEs faced unique challenges which affected their growth, competitiveness and effective contribution to economic development (GOK, 2005).

Cited amongst the prominent impediments was lack of access to credit to strengthen their financial base (IFC, 2011).

Conscious of this financial problem, the GOK pursued cheap credit as a means of promoting the development of this potential growth sector (Kimuyu and Omiti, 2000). Subsequently, the government established several financial lending institutions to bridge the gap between perceived credit requirements and the availability of credit (Ronge et al., 2002). Lending interest rates were also subsidised and loans to MSEs were fixed at low interest rates. It was expected that these measures would enable the important MSE sector to grow. But, despite this concerted effort, many enterprises could not sustain profits and, as such, three out of five businesses within the first few months ceased operating (GOK, 2007). Lack of finance was still widely argued to be the main cause of failure (Bowen et al., 2009; IFC, 2011).

If MSEs faced credit constraints, as indicated by Bowen et al. (2009) and IFC (2011), it could be perceived that the enterprises would have a very high demand for credit. Yet, the reality of the problem invalidated this assertion (CBS et al., 1999; Kimuyu and Omiti, 2000). For example, the National MSEs Baseline Survey (NMSEBs) conducted in 1999 indicated that about 90% of the MSEs surveyed did not demand any sort of credit from the formal or the informal financial sector (CBS et al., 1999). This was despite their positive perception that credit was necessary to make their business grow (Kimuyu and Omiti, 2000; Atieno, 2001; Bowen et al., 2009).

However, the credit access problem was not attributed to lack of demand for credit alone. Kimuyu and Omiti (2000) argue that many MSEs which may have demanded credit were in fact credit rationed. Two main reasons for this possibility have been suggested: First, the allocation of formal development finance to businesses was said to be geared towards the support of “big” businesses while credit to MSEs was rationed (Kimuyu and Omiti, 2000). Second, if the MSEs did demand credit, they were subjected to unfavourable credit under various conditions, which reduced their ability to access the credit required (Bowen et al., 2009). The net effect created outcomes where MSEs’ credit needs were not met (i.e., they were credit rationed).

The apparent inefficiencies in the credit market made the government realize the existence of unfavourable policy frameworks (GOK, 2005). One of the upshots of this realization was the change in lending policy from an individual mode of lending to group lending. Initially, the main trait of the government’s previous lending initiatives was that lending to MSEs was essentially based on individual mode lending. Thus, in the case of a standard individual loan agreement with a formal lender, a single borrower receives the credit, invests and then pays back at an agreed time or at equal intervals. However, since the year 2006, with the advent of the Microfinance Act of 2006, a paradigm shift in the lending policy was evidence. The government initiated programmes to support MSEs started lending mostly through group networks. Under group lending, lenders give credit to individual borrowers through a group-mode. This means that all members of a group are liable in case of a

default by a member - joint liability (Morduch, 1999). In this segment of the credit market, repayment started immediately after disbursement of the loan and proceeded regularly thereafter (Morduch, 1999).

Due to the fundamental impediments which prevented credit access to MSEs in Kenya, it is not implausible to deduce why the government and other lenders decided to adopt different lending strategies. However, the change in lending policy was done without a comprehensive theoretical and empirical examination into understanding the underlying reasons MSEs failed to access credit directly from lenders (GOK, 2005). It is in this context that this study should be read.

### 3. THEORETICAL UNDERPINNINGS OF CREDIT RATIONING

The issue of credit rationing has generated a great deal of debate in the economic literature over the last three decades. This debate is attributed to conjectural difficulties in so far as defining and measuring this phenomenon (Ghosh et al., 2001). The common thrust of the arguments stem from an effort to create and provide credible theoretical foundations on which empirical testing can be based. As a result, a number of different theoretical approaches that explained why most MSEs in developing countries were credit rationed arose. Though differing in specifics, they shared a common line of argument in that credit rationing stemmed from asymmetric information, and that incentive and contract enforcement problems were prevalent in credit markets of developing countries.

Out of this effort, two main types of credit rationing can be clearly identified: Price rationing and non-price rationing. Price rationing (an outcome of price discrimination) occurs when a lender sets different preservation prices (interest rates) depending on the perceived riskiness of categories of borrowers (Stiglitz and Weiss, 1981). The consequences of such, means that different interest rates are charged to different borrowers (Carter, 1988). However, given that differences exist between specific borrowers in so far as their risk and characteristics, separating the two categories requires near perfect information about market conditions – impossibility due to information asymmetry in credit market of developing countries (Stiglitz and Weiss, 1981). Therefore, price discrimination found little relevance in credit markets of developing countries.

Non-price rationing (commonly referred to as quantity rationing) refers to a situation where a lender is unwilling or unable to charge each customer an interest rate commensurate with the borrower’s risk class, the outcome being that some borrowers were given credit and others rationed regardless of the rate of interest they were willing to pay (Stiglitz and Weiss, 1981). Two arguments underpinned quantity rationing. First, the lender could not *ex ante* distinguish the risk presented by the type of borrower within a class of borrowers, and second, that the lender could not adequately monitor the action of borrowers after they accessed credit (Carter, 1988).

### 3.1. Asymmetric Information and Credit Rationing

In a neoclassical world of perfect markets, with perfect information and no transaction costs, credit rationing does not occur as the market forces adjust automatically to clear the market (Besley, 1994). However, in the 1990s, credit markets in developing countries diverged from this idealised situation because of imperfect information. This idea is expressed concisely by Besley (1994, p. 29) who argues that the “lender’s willingness to lend money to a particular borrower may hinge on having enough information about the borrower’s reliability and on being sure that the borrower will use the borrowed funds wisely.” Consequently, a lender had the prerogative to refuse to loan money to a borrower or he could offer less than what the borrower requested (Besley, 1994).

As information was not perfect, giving credit to borrowers required a lender to resolve the information-related problems of adverse selection, moral hazard<sup>1</sup> and repayment enforcement in credit markets (Armendáriz de Aghion and Morduch, 2005). The first problem of adverse selection occurred because of the lender’s inability to differentiate the risk type of the borrower *ex ante*. The second problem, moral hazard, occurred because the financed project payoff partly depended on the borrower’s actions, including the level of effort, as it determined the prospect of repayment. However, this effort was not easily observed by the lender. Some borrowers failed to put in sufficient effort; others used the loan for other purposes than originally intended, which compromised their ability to repay the loan (Armendáriz de Aghion and Morduch, 2005). The third problem of enforcement of credit repayment was considered an obstacle because of the lender’s limited ability to enforce repayment. In addition, the lenders had to contend with an inefficient legal system in arbitrating credit disputes when they arose.

Faced with the above market dilemma, lenders formulated credit contracts which attempted to maximize their expected returns. The formulated contracts, however, were not the agreements that cleared the market, which implied that the interest rate chosen by the lender was not necessarily the rate at which the supply of credit equaled the demand for credit (Wolfson, 1996). One lesson that emerged from this is that at “equilibrium” a credit market probably was characterized by credit rationing (Stiglitz and Weiss, 1981; Wolfson, 1996).

### 3.2. General Applicability of the Theory in Explaining Credit Rationing among MSEs in Kenya in 1990s

Although the findings of authors who have investigated credit rationing are diverse based on specific assumptions made in their respective models (Stiglitz and Weiss, 1981; Carter, 1988; Ghosh et al., 2001; Parker, 2001). They tend to support the basic premise that the credit market is prone to imperfect information and thus the market does not clear. This section attempts to describe, from a historical perspective, the general applicability of these propositions in the context of Kenya where the current study is based.

<sup>1</sup> Moral hazard occurs when a borrower simply fails to apply themselves diligently to their projects/business ventures compromising their ability to reimburse the loan (Armendáriz de Aghion and Morduch, 2005).

One common hypothesis suggested by the models reviewed (Stiglitz and Weiss, 1981; Parker, 2001; Ghosh et al., 2001), is that credit rationing is an upshot of the inefficiency that flowed from asymmetric information common in credit markets of developing countries. The underlying principle of this hypothesis cannot be overemphasized - though asymmetric information is not the only problem affecting credit markets. Proponents of the adverse selection hypothesis attest that lenders can estimate the returns of the financed project but not their risk. Two reasons explain why this assertion finds much relevance in Kenya in 1990s; first, the credit referencing facilities where lenders could have made reference to borrowers’ previous engagements was underdeveloped (Kimuyu and Omiti, 2000). This implies that there was minimal information sharing among lenders so that a risky borrower who failed to honour his previous contractual obligations could have continued to enjoy the credit facilities from other lenders (Armendáriz de Aghion and Morduch, 2005). The implication of this scenario is that lenders could not judge the riskiness of the borrower *ex ante*. Furthermore, not many MSEs had any sort of relationship with lenders especially in the formal financial sector (CBS et al., 1999). Lacks of this relationship imply the lenders hand incomplete information to gauge the risk profiles of borrowers.

Given that collateral can be used to mitigate against adverse selection in the credit market – by being the first line of guarantee against default - it is expected that all borrowers who offered adequate collateral could be given the required loan as they feared losing out in case of default (Bester, 1985). However, this scenario could only occur in an environment with an efficient legal system (Bester, 1985). An efficient legal system defines the rights of secured and unsecured creditors, and facilitates the enforcement of contractual obligations and sharing of credit information between intermediaries, leading to more efficient financial intermediation (Beck, 2000). However, during this period, legal systems in Kenya were and still are inefficient and weak, hindering the enforcement of contractual obligation (Kimuyu and Omiti, 2000). It can also be deduced that that financial institutions rationally took into account bankruptcy costs when they granted credit. High bankruptcy costs brought about by an ineffective legal system prevented financial institutions from granting large loans to small business borrowers because of the high risk of credit default.

Apart from the *ex ante* (adverse selection and moral hazard) problem, Kenya’s lenders were also confronted with *ex post* (dishonest discloser of information) asymmetric information problems (Mukiri, 2008). *Ex post* related problems arose in the credit market when the borrower declared a project return so low that he was unable to pay off his debt to the lender even if the return was in fact much higher than would be needed to do so (Hillier and Ibrahim, 1993). Ordinarily, the borrower could also have been tempted to under-declare the returns of his project if he perceived it too costly for the lender to verify his alleged returns. Moreover, the borrower could also have under-declared returns in circumstances where he enjoyed limited liability stemming from his inability to provide adequate collateral, especially when the legal mechanism to arbitrate contract disputes is inefficient.

However, the other aspect of credit rationing which - albeit was assumed by the asymmetric information models as postulated earlier is the subject of covariant risk. This is a risk which simultaneously affects large numbers of businesses that are located in the same region (Paxton et al., 2000). In Kenya, many lenders understood that they were dealing with a segment of businesses which were prone to covariant risk and which had a potential of creating massive default in the event of negative shock in production (Kimuyu and Omiti, 2000; Hillier and Ibrahim, 1993). Besley (1994) argued that this type of risk can be averted if lenders awarded loans that were well diversified. This implied rationing credit to some MSEs and investing in other secure areas such as in more established firms.

## 4. DATA SOURCE, DESCRIPTION AND THEORETICAL FRAMEWORK

### 4.1. Sources of Data

This study utilises quantitative secondary data derived from the NMSEB of 1999 which was undertaken to provide comprehensive data to meet the needs of the users and to provide statistics that can be comparable by regional and international standards. The survey used household as the basis of determining and identifying those economic units that were to be interviewed in detail. In total, 14,408 households forming 144 sampling clusters of about 100 households each were surveyed. However, despite the fact that the data provided details of various facets of MSEs in the survey, data on credit demand and supplied were only available from 1876 enterprises. This study largely utilised data from this sample.

In as much as the data is old; serves the purpose of this study. From the onset, this is a historical analysis. This period is specifically selected as it is the period which provided radical transformation in the lending policy from individual to group lending mechanism in most government lending initiatives. Specifically, the 1999 MSEs Baseline Survey formed the most elaborate data which provided a clear perspective of the problem affecting MSEs. This perspective “ignited” the government to action various initiatives to allow MSEs to access credit. It follows, to evaluate the change in the lending policy at the time; effort must be made to understand the historical root cause of the problem. Moreover, the 1999 MSEs survey is Kenya’s latest national and comprehensive data on MSEs credit access behaviour.

### 4.2. Preliminary Data Analysis of the Distribution of Credit in Kenya

Normally, a MSE can turn to various sources of finance when the need arises. The enterprise can often turn to debt financing, equity or retained profit to finance operations and growth. As in the case of MSEs, a firm can turn to formal finance sources and/or to highly priced loans from informal finance sources like money-lenders or “shylocks” as they are commonly known in Kenya. Besides, they can also get “free interest” loans from family members and friends. However, despite having a number of sources which an enterprise can turn to for debt financing, it is not possible to determine how important/available these channels of external financing were as the survey data contains only consolidated figures of the amount

demand and supplied to each firm. It is against this background that the current study does not offer an analysis of variables which affected rationing outcomes from various sources, but instead, attempted to analyse credit rationing from a “single source.”

A preliminary analysis indicated that MSEs accessibility of credit was fairly constrained. According to the MSE baseline survey on 1999, most enterprises mentioned credit constraints as a major problem which confronted their businesses. Considering that about 90% of enterprises perceived borrowing as necessary for their positive business health, non-application did not necessarily signify lack of demand for credit, but could have been an outcome of self-censorship/exclusion. This likelihood is plausible considering that approximately 71% of the applicants at the time succeeded in securing credit on application. On a regional basis, enterprises in rural Kenya, during the same period, had a low demand for credit and low access to credit probabilities compared to urban areas. This scenario may be explained by a lack of lending facilities in these localities at the time, a proposition which is supported by the fact that Nairobi and Mombasa had the highest concentration of enterprises applying for credit followed by other major towns.

The reality of self-censorship suggested in the preceding sections can be emphasized if considered together with other variables such as average net income earned by those entities. As indicated in Table 1 (which shows a description of variables used in estimating credit rationing) an average income of KES 9 288 per month (a reasonable amount in many rural households in Kenya at the time) constituted a sound financial base which could have been used to repay loans.

Consequently, low demand for credit from enterprises, despite reasonable incomes, supports the possibility that enterprises which did not demand credit might previously have applied unsuccessfully for a loan/s. The high success rate in terms of securing credit reinforces the belief that applications for credit were significantly limited by the phenomenon of self exclusion/self-censorship.

Other preliminary findings provide additional insight on the credit rationing justifications as suggested above. First, considering that about 74% of enterprises operated in open and semi-permanent structures provides insight into why these enterprises were discriminated against by lenders. In addition, about 82% of the businesses were operated on rented grounds, a situation which likely reinforced a lender’s perceptions that they were temporary enterprises and thus not creditworthy. Furthermore, only 36% of enterprises kept financial records of their operations, a critical requirement of lenders in terms of assessing a client’s ability to repay a loan. This suggested that lenders had incomplete information to correctly judge a borrower’s potential to repay a loan.

Second, since there is no clear separation between the owners of MSEs and their businesses, lenders took into account owners’ characteristics in evaluating the credit-worthiness of their enterprises. Owners’ gender, education and age mattered and

**Table 1: Description of variables used in estimating credit rationing**

Variables	Description	Mean±standard deviation
Demand	Dummy variable; positive demand=1, otherwise=0	0.06±0.24
Loan applied	Average amount demanded per year	41,031.50±110,282
Education	Number of years of schooling	9.15±3.54
Revenue	Average revenue per month	74,554±1,840,219
Income	Average income per month	9,288.20±52,093.50
Type of structure	Dummy; permanent=1, otherwise=0	0.26±0.44
Premises tenure	Dummy; own=1, rented, public and others=0	0.18±0.38
Bank account	Dummy; yes=1, no=0	0.24±0.43
Records	Dummy; keep records=1, no=0	0.36±0.48
Gender	Dummy; female=1, male=0	0.55±0.50
Registration	Dummy variable; business registered=1, no=0	0.13±0.33
Type of business	Type of business; partnership=1, others=0	0.06±0.24
Membership	Group membership; yes=1, no=0	0.25±0.43
Employees	Number of employees	0.14±0.073
Household size	Household size	3.85±2.46
Respondent's age	Age of the respondent	34.01±11.29
Business age	Year when the business started	1994
License	Business is licensed; yes=1, no=0	0.40±0.49

affected the prospects of their enterprises in securing credit. Armendáriz de Aghion and Morduch (2005, p. 13), for example, reported that “Grameen has found that not only does having a customer base that is 95% female improve social impacts, but it may also reduce the financial risk for the bank,” implying that lenders may be more willing to lend to women rather than to men. This assertion is given credence by the survey findings, which showed that 72% of women who applied for a loan received the full amount requested as compared to 66% of the men. However, the education and age variables seem unimportant in determining credit rationing, since credit access was uniformly distributed across age groups and entrepreneurs' education standards. It could be suggested that this unexpected outcome arose from MSEs reliance on informal credit markets where entrepreneur's social capital built up overtime which superseded other considerations in evaluating repayment probabilities.

Additionally, many MSEs did not operate a bank account as only 24% of respondents indicated they had an account. Given that many formal financial institutions required clients to open a bank account before granting a loan, suggests that a high credit rationing incidence could have been an outcome of low demand for other banking services. With regards to the legal status of the enterprise and credit rationing, only 13% of the enterprises operated businesses registered by the local authorities. This means that most of the enterprises were not recognised by any authority and so could not be pledged as collateral against credit. Similarly, most enterprises were operating without business licences. Since the main source of local authorities' revenue is generated by licensing business enterprises, non-compliance in most cases was met by forced business closure, litigation and other forms of harassment. No credible lender is likely to lend to a business which operate outside the law.

A MSE's membership of a particular savings/credit group was important as it enables the group to save and access credit more easily and possibly at more favourable rates (Paxton, 2001). It is in this context that membership of a group by an enterprise might

translate into more loan applications and consequently increases access to credit (supply). However, concerning this attribute, only 25% of respondents belonged to one or more savings and credit groups. The low memberships of these savings/credit groups could have explained the lack of credit demand and supply - the precursor of rationing (CBS et al., 1999).

In an ideal situation, one expects lenders to give more credit to borrowers who have a proven record of good repayment. Additionally, as time passes, MSEs progressively self-select themselves into the credit market. On average, many enterprises were started in 1994. Thus, in the year of the NMSEB (in 1999), the majority of the enterprises were <5 years old, implying limited prior engagement with the lenders - also a precursor of credit rationing (Ghatak and Guinnane, 1999; Armendáriz de Aghion and Morduch, 2005).

### 4.3. Theoretical Framework and Data Analysis

Practical testing of credit rationing in developing countries is still very limited. However, notwithstanding this limitation, two historical strands of literature suggest empirical ways of testing credit rationing. On the one hand, is the method employed by Kochar (1997), where she utilised a demand and supply structural model to compute the resultant credit rationing. On the other hand, credit rationing can be estimated by formulating a survey mechanism that allows the separation of various samples depending on their effectual credit demand and supply, which would make it possible to measure the credit rationing for each borrower (Baydas et al., 1994; Zeller, 1994).

Given that this study utilises data from a national survey which did not separate various demand outcomes as indicated by Baydas et al. (1994) and Zeller (1994), the alternative approach of Kochar (1997) and later adopted by Swain (2002) is utilised. The current study estimates the extent of credit rationing by utilising a set of two structural equations: In the first model, it is assumed that the demand for credit was a function of the lender's decision in respect of granting access to credit. For this purpose, a univariate

probit model is estimated. The second model builds on the first and estimates the probability of borrowing that is assumed to depend both on the lender's decision in respect of granting access to credit and also on the MSE's demand for credit (bivariate probit model). The estimation of the parameters in the two equations enables the prediction of the probability of each rationing outcome.

#### 4.4. The Univariate Probit Model (Model 1)

Kimuyu and Omiti (2000) survey shows that there was a positive perception towards credit by MSEs. In line with this argument, the model follows the literature (Iqbal, 1983; Kochar, 1997; Swain, 2002) by assuming that the probability of borrowing was determined exclusively by the lender's decision with regard to accessing credit. The first equation therefore investigates the probability that a MSE received credit given its characteristics. The estimated model can be specified as follows:

$$Y_i = x_i' \beta_1 + \varepsilon_i \quad (1)$$

Where,  $Y_i^*$  is the revealed supply which takes a dummy variable of 1 if the MSE was given full credit and 0 otherwise (given less than applied) and  $x_i$  is the vector of explanatory variables.

#### 4.5. The Bivariate Probit Model with Partial Observability (Model 11)

Applying a univariate model, it is assumed that MSEs positively demanded credit. This assumption may be unrealistic in reality (Swain, 2001). The bivariate probit model with partial observability drops this assumption and estimates the probability of securing access to credit is determined by both the demand for formal credit and the lender's decision in respect of granting access to credit. The formal presentation of the model is as follows:

$$Z_{1i} = \beta_1 X_{1i} + \varepsilon_{1i}; y_{1i} = 1 \text{ if } z_{1i} > 0, \text{ otherwise } 0 \quad (2)$$

$$Z_{2i} = \beta_2 X_{2i} + \varepsilon_{2i}; y_{2i} = 1 \text{ if } z_{2i} > 0, \text{ otherwise } 0 \quad (3)$$

$$[\varepsilon_{1i}, \varepsilon_{2i}] \sim \text{bivariate normal (BVN)} (0, 0, 1, 1, \rho) \quad (4)$$

Where  $X_{1i}$  and  $X_{2i}$  are variable vectors determining access to credit ( $Z_{1i}$ ) and demand for credit ( $Z_{2i}$ ) from the financial sector respectively. The two equations can be estimated consistently by single equation probit methods. However, this is inefficient in that it ignores the correlation between the disturbances. For this reason, a bivariate probit model is estimated in which, instead of separately observing  $y_{1i}$  and  $y_{2i}$  (dummies representing credit access and demand respectively) the product  $y = y_{1i} \cdot y_{2i}$  (representing the probability of access given demand) is observed (Poirier, 1980). This is necessary because the study is concerned with observing the final outcome of the two decision processes which lead to a single conclusion.

## 5. RESULTS AND DISCUSSION

The process of measuring credit rationing as previously described requires a two-step estimation progression. The univariate probit estimation determine the probability of MSEs accessing credit given their characteristics and the bivariate probit model with

partial observability was estimated to capture the extent of credit rationing, given a positive demand.

### 5.1. The Univariate Probit Estimation for Credit Access

According to the estimation results contained in Table 2, the probability of access was determined by the structure of the business premises, whether the enterprise had an account with the lender, the level of income and membership to a savings and credit group. As expected, the nature of the structure – used as a proxy to illustrate the permanency of the business – is significant at 5%. This implied that the more permanent the structure from which the enterprise operated, the higher the probability of access to credit. Similarly, those enterprises that reported having an account with the lenders had a higher chance of accessing more credit than borrowers without an account.

As expected, borrowers who belonged to a particular group were expected to access more credit than borrowers without such association. Similarly, a gender consideration in determining access is relevant albeit at 10% significance level.

The enterprise level of income (log of income), however, is negatively related to credit access by enterprises. One reason which may explain this discrepancy (as income is supposed to be positively related to accessing credit) is the fact that micro enterprises in Kenya relied mostly on informal lenders, which are argued to possess superior access to information reduce credit rationing (Aryeetey, 1998). However, as enterprises become more profitable, the need for more advanced credit portfolios also arose, which sometimes was beyond the capacity of the informal sector. Consequently, this segment was forced by circumstances to borrow from the formal finance sector with stringent conditions, translating into lower success probabilities.

Other variables indicating the expected results, though insignificant are strata, registration, and type of business. Strata, used as a proxy for the rural versus urban location of business, points to a preference of supplying more credit to enterprises located in

**Table 2: Expected sign and actual parameter estimation of access to credit**

Variable	Expected variable sign	Parameter estimates	Standard error
Constant	±	-2.613	0.681
Level of education	+	0.123	0.253
Owner's gender	±	0.243***	0.128
Strata	±	0.241	0.171
Registration	+	-0.136	0.186
Type of business	±	0.053	0.225
Account	+	0.605*	0.131
Records	+	-0.077	0.136
Membership	+	0.288**	0.125
Income	+	-0.009	0.050
Tenure	+	0.101	0.164
Structure	+	0.284**	0.138
Pr (access)	0.04		
Log likelihood	-259.044		
Sample size	1542		

\*\*\*\*\*indicate significance at 1%, 5%, 10%

**Table 3: Bivariate probit estimates of demand and access to credit**

Variable	Access		Demand	
	Parameter estimate	Standard error	Parameter estimate	Standard error
Constant	-2.629	0.654	-3.223	0.619
Level of education	0.084	0.244	0.424	0.238
Owner's gender	0.254**	0.123	0.031***	0.110
Strata	0.219	0.166	0.188	0.146
Registration	-0.079	0.180	-0.058	0.156
Type of business	0.084	0.213	-0.132	0.203
Account	0.571*	0.128	0.539*	0.115
Records	-0.071	0.134	0.083	0.116
Membership	0.209***	0.124	0.330*	0.111
Income	0.011	0.048	0.023	0.043
Tenure	0.072	0.162	0.138	0.142
Structure	0.249***	0.135	0.170	0.121
Rho	0.936			
Pr (access demand)	0.03			
Log likelihood	-480.472			
Sample size	1541			

\*\*\*\*\*Indicate significance at 1%, 5%, 10%

the urban areas rather than to those in rural areas, an outcome associated with various aspects of comparative advantage enjoyed by urban enterprises. Besides, more lenders were concentrated in urban areas, which translated into a greater supply of credit in these locations. Likewise, registration of an enterprise (implying formality) is an aspect considered favourably by lenders when weighing up applications for credit. In addition, jointly-owned businesses (proxied by bus-type of business) were preferred by lenders since jointly-owned enterprises were considered safer than sole proprietorships, since in partnerships, risk is shared among different owners.

Lastly, the model predicts a high degree of rationing. The probability of access to credit yields the value 0.04. This value evaluates at the mean levels of the explanatory variables. If all borrowers who apply for credit obtain the full loan demanded, the estimated probability tends towards the value of 1. Consequently, under the assumption that enterprises had positive demand for credit, about 96% of the enterprises were credit rationed. This rate is high in comparison to a study done by Swain (2002), who found a lower level of credit rationing of 71% in rural India. Nonetheless, considering that not all MSEs in Kenya had a positive demand for credit (an assumption made in this model) the implication is that the enterprises were either not as constrained as the data suggests or as credit rationed as the result of the model's outcome.

### 5.2. The Bivariate Probit Model

This model specifies the probability of access to credit granted as a bivariate normal distribution, jointly determined by the lenders' decision granting access to credit (supply) and borrowers' decisions in respect of credit demanded. The joint determination in this model effectively drops the main assumption in Model 1 that enterprises had a positive demand for credit, a factor contributing to the difference in the probability of successfully accessing credit that can be observed between the two models.

As indicated in Table 3, the bivariate estimation shows that the enterprises whose owners belonged to a group, and/or were operated by a woman/women and who operated an account with

the lender, tended to have higher probability of applying for credit. As established in Model 1, the important explanatory variables explaining the probability of access remain unchanged.

Given that access is a product of demand and supply decisions, it is expected that the combined probability of access (given positive demand), is lower than in a univariate estimation of access alone. As a result, the probability of access to credit, given the demand and access is 3% implies that nearly 97% of the enterprises were credit rationed. This figure is relatively higher than the Kochar (1997) and Swain (2002) findings of 76.48% and 60% respectively because of India's relative advanced financial markets (both formal and informal) and the role played by the Indian Government to subsidise the cost of credit to the poor (Swain, 2002).

Given the high prevalence of credit rationing in Kenya during the 1996-2006 decade (more than other countries expounded by studies cited by Kochar (1997) and Swain (2002); it was crucial for Kenya to change their dynamics of lending - at least to experiment whether another method could work. The outcome of this section is critical in evaluating whether the mode of lending adopted would mitigate the hiccups linked to previous credit rationing.

## 6. CONCLUSION

The general consensus from this study is that credit lenders were risk averse and since they could not differentiate the riskiness of each loan applicant, they used their observable characteristics to gauge their probability of credit repayments. This assertion is corroborated by the results of the two models which indicated the degree of effective credit rationing as 96% (in Model 1) and 97% (in Model 2) which confirms the findings of the earlier studies by Kochar (1997) and Swain (2002).

The results of this study therefore support the findings recorded in the literature that credit policies still had an important role to play in business development. The high degree of credit rationing in Kenya signified the importance of developing policies that were

geared towards the improvement of demand and increasing the chances of accessing credit. In particular, policy instruments geared towards streamlining and enhancing contractual enforcement mechanisms, improvement of enterprises' creditworthiness and increasing and expanding credit supply system across the country needed to be encouraged.

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