A historical analysis of credit access to micro and small enterprises in Kenya

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Declaration by student

I, Kenneth Majau Mugambi, declare that the research reported in this dissertation, except where otherwise indicated, is my original research. It has not been submitted for any degree or examination at any other university. It does not contain other persons' data, pictures, graphs, writing or other information without due acknowledgement.

Abstract

In 2006, the government-supported microfinance programmes implemented by the Kenyan government started lending credit to Micro and Small Enterprises (MSEs) using a group-lending mode, a change which represented a paradigm shift from individual lending mode. The overall aim of this research is to provide an investigation of whether the transformation of this lending policy was backed by any theoretical and empirical support. Specifically, the entirety of this study is intended to give an insight of what might have influenced the change, what informed it and what might have been overlooked. To achieve clarity and the study aim, the research is compartmentalised into three discrete studies. In the first study, a historical investigation into the factors which hindered MSEs from acquiring credit was undertaken. The second study investigated the reasons MSEs were credit rationed. The third study investigated whether the problems experienced by MSEs, associated with lack of credit access (lack of credit demand and rationing), could have been mitigated by group lending. The research utilised quantitative research design, the first two studies utilised data derived from National MSEs Baseline survey conducted in 1999. The third study utilised primary data collected from micro credit groups of the Kenya Rural Enterprise Programme (K-REP) in 2006 in Nairobi, Kenya. Various economic models and regression analysis were utilised in analysing different outcomes. In particular, the research utilised Univariate Probit, Bivariate Probit and Heckman Two-Stage Models to model various credit access outcomes. The study found that group lending largely mitigated information asymmetry- the main cause of MSEs failure to access credit. However, the study concludes that asymmetric information was not the only source of credit failure in Kenya. For group lending to work, or to have worked, it required support by other pro-MSE programme dynamics. This suggested that the government decision to change policy was partially informed by theory and practice.

Key words

Demand for credit, credit rationing, GOK, Group lending, individual lending, information asymmetry, lending policy, Micro and Small enterprises

Dedication

I dedicate this thesis to my late Dad, Bernard Mugambi for what he has been in my life. He gave me identity; he taught me basic life survival skills; and he provided financial support and inspiration. He remains my role model.

God rest his soul in eternal peace.

Acknowledgements

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Abbreviations

CBS	Central Bureau of Statistics
EA	Enumeration Area
FSD	Financial Sector Deepening
FINCA	Foundation for International Community Assistance
GDP	Gross Domestic Product
GOK	Government of Kenya
ICEG	International Center for Economic Growth
IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
ILO	International Labour Organisation
IMF	International Finance Corporation
JSC	Juhudi credit Scheme
KES	Kenya Shilling
KNBS	Kenya National Bureau of Statistics
K-REP	Kenya Rural Enterprise Programme
KNBS	Kenya National Bureau of Statistics
MDG	Millennium Development Goals
MSE	Micro and Small Enterprise
MSEs	Micro and Small Enterprises
NARC	National Rainbow Coalition
NASSEP	National Sample Survey and Evaluation Programme
NGO	Non-Governmental Organisation
NMSBES	National Micro and Small Enterprise Baseline Survey
ROSCA	Rotating Savings and Credit Association
ROSCAs	Rotating Savings and Credit Associations
SACCOs	Savings and Credit Cooperative Societies
SAPs	Structural Adjustment Programmes
SMEs	Small and Medium Enterprises
PPPCR	Projet de Promotion du Petit Credit Rural

UNDP   United Nations Development Programme

YDF   Youth Enterprise Development Fund

Definition of Terms

This section provides definitions of some of the concepts used in this study. It contains terms which have different meanings depending on the context of their usage.

Adverse selection

The risk of adverse selection arises when a borrower had some inherent characteristics that could not be observed by the lender but affected the borrower's ability to repay the loan (Stiglitz and Weiss 1981).

Borrower

Someone who receives credit on the promise to return it, plus interest or its equivalent in the future. For the purpose of this study, a borrower can be a person or businesses entity.

Credit

For the purpose of this study, credit means money borrowed by micro and small enterprises from formal and informal financial institutions to support their business activities.

Credit rationing

Credit rationing occurs when a lender is unwilling or unable to charge each borrower an interest rate commensurate with the their 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). The net outcome is where credit supplied is less than demanded.

Default

Default is the inability to repay the loan by either failing to complete the loan as per the loan agreement or neglect to service the loan (K-REP 2000).

Free rider problem

A free rider problem refers to situations where goods are underprovided or not provided at all because individuals are able to consume the good by paying little or nothing towards the cost.

Group lending

This study adopts a definition used by Morduch (1999) who proposed that group lending refers to the arrangements by individuals without collateral who get together and form groups with the aim of obtaining credit from lenders. In group lending, loans are made to individuals, but the group as a whole is held jointly liable, should repayment difficulties arise.

Individual lending

This is a type of lending in which lending programmes loan directly to individual MSEs. Lending programmes are responsible for screening, and monitoring their borrowers. They are also responsible for enforcing reimbursement (Armendáriz de Aghion and Morduch 2005).

Informal and formal financial sector

The informal financial sector refers to a component of the financial intermediation activities that is not directly supervised by a central monetary authority of a country. On the other hand, the formal financial sector refers to a component that is directly controlled by some regulatory authority (Aryeetey 1998).

Information asymmetry

Information asymmetry is the situation where at least one party to a contract has more or better information than the other party(ies). Information asymmetry favours the party with better information in contract enforcement (Stiglitz and Weiss 1981).

Joint lending liability

This is an aspect of the group lending mechanism whereby all the members of a group are held responsible / jointly liable for the repayment of a group loan (Morduch 1999).

Jua kali

The literal translation of Jua Kali in Kenyan Kiswahili (the dialect of Kiswahili language spoken in Kenya) is micro enterprises with no formal recognition.

Lender

Someone who makes funds available to another with the expectation that the funds will be repaid, plus any interest and/or fees. A lender can be an individual or an institution.

Micro and small enterprises (MSEs)

There are different criteria used to define MSEs. However, this study adapts the definitions used in the Kenya National Micro and Small Enterprises Baseline Survey of 1999 (CBS *et al*. 1999), which defines micro enterprises as those enterprises that employ a maximum of 10 workers which includes all people working in the enterprise regardless of whether they are paid or not. A small enterprise, on the other hand, is defined as a business entity that employs up to 50 paid or voluntary workers.

Moral hazard

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).

Rural

Rural is defined as a large and isolated area of an open country (in reference to open fields and not forests), often with low population density (GOK 2010).

Urban

This study adopts the definition of Kenya National Bureau of Statistics, which state that "**Urban**: Is an area with an increased density of human-created structures in comparison to the areas surrounding it and has a population of 2,000 and above. In this definition, urban areas include the following: cities, Town Councils and Urban Councils. The City of Nairobi, Mombasa, all Municipalities, District Headquarters, all towns and trading centres with a population of 2,000 persons or more are designated as urban areas." (KNBS 2010: 5).

CHAPTER ONE

THE PERSPECTIVE OF THE RESEARCH AND SUMMARY OF THE STUDY AREAS

1.1 Introduction

Given the past 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 - Micro and Small Enterprises (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 mode from individual to group lending in 2006 (Kodongo and Kendi 2013).

Current research generally utilises historical theories and data generated between the 1996 – 2006 decade to assist policy makers and other practitioners in micro-finance to contextualise the change in the lending policy. Specifically, the entirety of this thesis is intended to give an insight of what might have influenced the change, what informed it and what might have been overlooked. This thesis will also offer recommendations of possible areas in which the credit access to MSEs could be improved. The remainder of Chapter One is organised as follows: Section 1.2 provides the general background to the problem. Section 1.3 provides the research problem and Section 1.4 summarizes the study areas and research questions.

1.2 Background to the Problem

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 (GDP) (CBS *et al*. 1999). In addition, they formed the backbone of the employment opportunities alongside promoting proletarian economic

augmentation and equitable economic expansion (Pelham 2000). However, despite the 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 (Wanjohi and Mugure 2008; IFC 2011).

The problems that MSEs faced with the lack of credit access was compounded by Kenya's low level of savings and underdeveloped equity markets, which cumulatively led to low levels of investment in this sector (Ronge and Kimuyu 1997). This, in turn, impeded the capacity of the enterprises to grow, innovate and produce more goods efficiently and compete effectively in the competitive market (Galindo and Schiantarelli 2002). Moreover, as Conning and Kevane (2002) argued, where opportunities for accessing credit are limited and insurance systems are missing, enterprises become highly vulnerable to negative income shocks. This condition forced many enterprises to forgo activities with higher returns that could have made better use of their resources (Conning and Kevane 2002). Instead, they chose less risky but lower return activities that in the end had a negative impact on their growth and potential contribution to their economic development (Conning and Kevane 2002).

Conscious of this financial problem, the Government of Kenya (GOK) pursued cheap credit as a means of promoting the development of this 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 (Ronge *et al*. 2002). Therefore, it was expected that with such input of effort; the provision of credit would enable this important sector to grow. But, despite this concerted effort, many enterprises could not sustain profit 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 by the Central Bureau of Statistics (CBS) in corroboration with Kenya Rural Enterprise Programmes (K-REP) and International Center for Economic Growth (ICEG) 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 could not be attributed to lack of demand for credit alone (Kimuyu and Omiti 2000). Many MSEs which demanded credit were rationed (Kimuyu and Omiti 2000). Two main reasons 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 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 individual mode of lending to group lending. Initially, the main trait of the government's previous lending initiatives was that lending to MSEs was basically done based on individual mode lending. For a standard individual loan from a formal lender, a single borrower receives the credit, invests and then pays back at an agreed time or at equal intervals. Ordinarily, the borrower is not supposed to pay almost immediately after receiving a loan. The grace period provided is intended to give him/her time to invest the money and start earning a return from the project before repaying the lender (Armendáriz de Aghion and Morduch 2005). Generally, this means that the lender expects to be repaid with income generated from the invested capital. However, since the year 2006, with the advent of 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).

1.3 The Research Problem

The change in lending policy, from individual to group lending by the government supported programmes, was done without a comprehensive theoretical and empirical examination into understanding the underlying reasons MSEs failed to access credit (GOK 2005). This thesis therefore, evaluated the change of credit policy. To give the contextual analysis of such change, this thesis covers two thematic areas which are organised into three substantive studies. The first two studies contextualise the shift in lending policies through analysing the previous possible causes of individual lending failures.

To clearly understand and appreciate if group lending could have alleviated institutional impediments associated with individual lending to MSEs in the 1996 – 2006 period, the starting point perhaps is to understand what caused MSEs not to demand credit in the first place. The first study presented in Chapter Three provides the possible factors which may have hindered MSEs from demanding credit on an individual basis. The second study presented in Chapter Four, examines the factors which caused lenders to ration credit (where credit supplied is less than demanded) to MSEs when they demanded credit. Therefore, these two studies (contained in chapter three and four) will contextualize the reasons MSEs failed to obtain credit.

The second thematic area, compartmentalized as a different study (Chapter Five), is intended to achieve two objectives. Primarily, it investigates the usefulness of group lending mechanisms in alleviating the problem encountered in the individual lending mechanism. However, the question of concern is whether limitations associated with individual lending (as discussed in the first and studies) could all have been moderated by this mode of lending. Moreover, since most lending by formal lenders to MSEs is nowadays done mostly through the group lending mechanism, effort must also be made to improve it against possible shortcomings (Armendáriz de Aghion and Morduch 2005). Identifying the weakness of group lending mode will give an insight into the

factors which might have been overlooked when selecting it as the main mode of giving credit to MSEs

1.4 Research Aim and Objectives

The preliminary studies outlined in Subsection 1.2 and subsequent literature contained in Chapter Two, points to a historical financial problem affecting MSEs due to lack of credit access. Moreover, the studies also showed a general change in lending mechanism, that is from individual to group lending. The overall aim of this research therefore is to provide an investigation of whether the transformation of this lending mechanism was backed by any theoretical and empirical support. This thesis, therefore aimed to achieve the following specific objectives:

1. The first objective investigated the possible historical factors which hindered MSEs from demanding credit from the financial sector. This stage was intended to form an existing base of reference on which the change in lending policy was evaluated.

2. The second objective investigated the historical causes of credit rationing to MSEs. This investigation assisted in assessing whether lending through group network would have eased credit rationing.

3. The third objective endeavoured to determine the capability of group lending in alleviating the problems associated with Objective One and Two. This was intended to gauge whether the change in lending policy had theoretical and empirical support during 1996 - 2006.

4. The fourth objective aimed at identifying the organisational, social and programme design characteristics that affected group lending repayment performance.

These objectives give rise to the following questions:
1. What are the historical factors that hindered MSEs from demanding credit?
2. What are the historical factors that affected credit rationing in the finance sector?
3. To what extent is Kenya's current credit policy informed by the theoretical and empirical literature on micro-finance?
4. What factors were assumed during the change?

CHAPTER TWO
PRELIMINARY LITERATURE REVIEW

2.1 Introduction

This chapter discusses the context of the problem as was experienced by MSEs during the period of the study and the chronological transformation of the credit policy framework in Kenya over-time. The Chapter is organised as follows: Section 2.2 discusses the importance of MSEs in Kenya in terms of alleviating poverty and generating employment, it also analysis various challenges experienced by the sector; Section 2.3 evaluates the historical development of policies relating to MSEs located in Kenya while Section 2.4 shows evidence of financial constraints in the MSE sector in other countries; Section 2.5 outlines the credit problem in Kenya and Section 2.6 concludes this chapter.

2.2 The General Economic Performance in Kenya and the Role of MSEs

Kenya is an African country that experienced quite substantial growth in the early years of independence, but such growth declined within a few years. The decade after independence portrayed a country full of optimism based on the belief that self-determination will propel the country to greater heights of economic growth and development (GOK 1965). Indeed, this expectation was not misplaced. After independence in 1963, the Government of Kenya identified poverty, disease and ignorance as the main challenges to be addressed in order to achieve sustainable national development (GOK 1965). To overcome these challenges, the Kenyan government instituted various short-term and mid-term development plans and strategies which were intended to guide the development agenda for the country. One significant attempt was the Sessional Paper No. 10 on African Socialism and its Application to Planning (GOK 1965). It advocated for investment to be targeted on the main production sectors of the economy that was expected to produce the highest returns. The outcome of the strategy was the introduction of pro-production interventionist policies where public investment, agricultural production, and pro-private sector investment initiatives were supported (GOK 1965). As a result, GDP grew at an annual average rate of over 6% up to the mid 1970s (McPherson and Rakovski 2000). This growth rate compared favourably with those of many developing countries (Rono 2002). Kenya indeed, had apparently higher per capita income than most of the sub-Saharan countries during

this period of time (Rono 2002). The first decade was therefore a period of great inspiration and expectation.

However, the government was unable to sustain this trend and by the 1990's, the rate had declined to 2.3% (McPherson and Rakovski 2000). Various interacting factors contributed to this scenario. Foremost, the Kenyan Government's inward looking policies failed to structurally transform the economy from the reliance on a few agricultural crops to other complementary sectors of the economy (United Nations Development Programme (UNDP 2006). Since raw agricultural exports, by nature, are vulnerable to international price fluctuations, the dependence of Kenya on coffee and tea heralded unfavourable terms of trade which subsequently reduced foreign exchange earnings. During the same time, the country's population growth rate averaged 4.0% which for some years outstripped economic growth. This scenario, coupled with deteriorating infrastructure and extreme disparities in wealth, limited the opportunities of most people to develop their skills and knowledge (UNDP 2006).

Due to this reduction in economic performance, the Kenyan Government, with support from the World Bank and the International Monetary Fund (IMF), initiated Structural Adjustment Programmes (SAPs). These programmes were aimed at restructuring the economy and increasing efficiency in the allocation and utilisation of public funds and reducing government control of the market. In addition, it was hoped that these programmes would help to reduce trade barriers and fiscal deficits (GOK 1997). New measures involving privatization of public resources, trade liberalisation, public sector reforms and government expenditure reduction were initiated. The initiative has since been widely criticised for amplification of the problem rather than resolving it (Rono 2002). The lessons learnt from the SAPs' initiatives are succinctly captured in the Sessional Paper no. 3 of 1999 (GOK 1999) on National Poverty Eradication. It points to a policy gap between very broad national plans and their operationalization, coupled with inappropriate design and weak implementation as the main source of the failure. Consequently, these initiatives were largely discarded (Rono 2002).

Nevertheless, in the year 2003, when the National Rainbow Coalition (NARC) Government came into power, a five year Economic Recovery Strategy for Wealth Creation Plan was initiated

(GOK 2005). This plan was anchored on four pillars with the primary aim of restoring economic growth, improving and strengthening of governance structures, rehabilitation and expansion of infrastructure and investment in human resources. Hence, the unfavourable outlook was replaced by some level of optimism arising from prospects of economic recovery. During 2003 to 2007, the economy grew from 2% to 7% per annum. This was generally attributed to the resilience of the economy, enhanced investment confidence, strong macroeconomic policies and a vibrant global economy (GOK 2008). Though the post-election violence experienced in early 2008 and subsequent downturn of the global financial crisis greatly affected Kenya, the economy, according to the GOK (2010), is slowly picking up the pre-crisis growth momentum again.

Despite the recent encouraging economic outlook, over two decades of continued economic decline pushed the poverty prevalence levels from 27% in 1973 (Chune 2003) to 46% in 2007 (Suri *et al.* 2008). The same period showed the widening of an income gap between rural and urban dwellers and between the poor and the wealthy (Suri *et al.* 2008). For Kenya to move away from this depressing state of affairs and achieve the Millennium Development Goal (MDG) of halving poverty by 2015, as well as its aim of achieving the goals set out in its Vision 2030 (government blue print of transforming the country into a middle income economy by year 2030); the economy needs to grow by more than 10% per annum in the intervening period (International Food Policy Research Institute (IFPRI) 2007). Therefore, it was imperative for Kenya to search for alternative sources of poverty-reducing growth. In this regard, a different approach from the earlier initiatives seems to be gaining acceptance from the government. This new approach, which foresees the reduction of poverty, envisages the strengthening of MSEs as middle level firms of the future by improving their efficiency and competitiveness (GOK 2007).

The realisation that this sector is critical to the alleviation of poverty and unemployment is fundamental to the government's goal in promoting a stable economy (GOK 2007). The MSE sector has the potential to reduce unemployment through job creation for persons not able to access jobs in the mainstream economic sectors (GOK 2007). According to the last NMSEBs of 1999, Kenya had about 1.3 million MSEs providing employment to 2.4 million people, an equivalent of 15% of total national employment in that year (CBS *et al*. 1999). Moreover, the Economic Survey of 2008 showed the sector contributed to over 50% of new jobs in the year

2005 and 89.9% between the years 2006 and 2007 (GOK 2008). In addition, as noted in the Sessional Paper no. 2 of 2005, the sector also provided 18.4% of the GDP and employed about 74.2% of the total persons engaged in employment (GOK 2005). This is in addition to promoting competition and innovativeness and enhancing the enterprise culture in Kenya. Furthermore, the rationale behind supporting MSEs is also underpinned by the consideration that their growth benefits both urban and rural households, whereas industry-led growth benefits a smaller segment of the urban population, thus exacerbating inequality. More to the point, the sector is easy to venture into, relies on indigenous resources, is likely to be owned at the household level (owned by family members) and operates mostly at a small scale and is labour-intensive.

In as much as the role of MSEs is a mechanism for reducing poverty and creating employment, past statistics indicate that three out of five businesses fail within the first few months of operation (GOK 2007). According to Amyx (2005), one of the most significant challenges is the negative perception people have of MSEs. Many prospective clients have a misconception that MSEs are unable to offer quality services and may not satisfy more than one project at the same time (Amyx 2005). As a result, bigger players who have already carved a name for themselves are more likely to dominate the market (Amyx 2005). Moreover, starting and managing a small business has both prospects of success and failure (Longenecker *et al*. 2006). A simple management error is likely to lead to the death of a MSE, hence there is very little room to learn from simple past mistakes (Longenecker *et al*. 2006).

Insufficient credit is also a major constraint facing MSEs, which has also hindered their development (Oketch *et al*. 1995; Oketch 2000). Sessional Paper no. 2 of 2005 identified limited access to financial support and unfavourable policy frameworks as the main impediments to MSE growth (GOK 2005). Aware of this problem, the government over the last decade came up with programmes intended to bridge this gap - Youth Development Fund, Women Development Fund and Uwezo Enterprise Fund were created (Kiraka *et al*. 2013). Moreover, the government also recognised that the prior policies and strategies targeting this growth sector were formulated in the absence of reliable information on the factors influencing growth and dynamics of the sector (GOK 2005). This thesis is intended to assist in the improvement of MSEs credit policy

framework by investigating whether the changes made in lending policy had any theoretical and empirical support. It is in this context that this thesis should be read.

2.3 Development of MSEs Credit Policy in Kenya

The origin of a coherent strategy focused on MSEs by the Kenyan Government is perhaps traceable to an International Labour Organization (ILO) report (1972) on the state of Kenya's employment rate. Prior to this, Kenya's development policy in the first decade after their 1963 independence favored large, formal institutions. There was no policy to guide the informal sector activities which were perceived as falling outside the system of modern commerce, technology and entrepreneurship (McCormick 1999). This policy vacuum was costly to the informal sector due to lack of security of tenure and property, and inadequate support infrastructure (McCormick 1999). According to McCormick (1999), the policies created the missing middle phenomenon, - a situation where there were large and formal enterprises on one hand, and small enterprises on the other hand. To try and bridge this gap, institutions such as the Kenya Industrial Estates were established in 1967 to finance small scale formal industries (McCormick 1999).

Other subsequent initiatives included The District Focus for Rural Development strategy which was launched following a recommendation in the 1983-1989 Development Plan (McCormick 1999). This plan aimed at achieving a balanced growth through decentralization of industrial activity from urban to rural areas. Apart from encouraging decentralization, small scale industrial sheds were built. However, this initiative was not sustained and was discarded (ICEG 1998). However, MSE policy framework in Kenya got a boosts after the publication of Sessional Paper 1 of 1986 (McCormick 1999; ICEG 1998). This was the first time reference was made to the informal sector as a critical component of Kenya's industrial structure. A comprehensive framework, upon which future initiatives were to be based, was developed. The framework set a supportive policy environment, strengthening vocational training, improving access to credit and export market creation (McCormick 1999; ICEG 1998). In 1987, the District Development Fund was established to provide a conducive infrastructure through the development of Rural Trade and Production Centers (Ronge *et al*. 2002). In addition, the Rural Enterprise Fund was established in 1989 to finance MSEs (Kimuyu and Omiti 2000).

In line with the demands for a liberalized economy and the need for enhanced private sector participation, Sessional Paper No. 2 of 1992 called for the government to only play a facilitative role, leaving the MSE to meet their own needs. The government would create a conducive working environment through infrastructure development, research and development, linkages between small and large enterprises, and export orientation (Mullei and Bokea 1999). During the 1994-1996 Development Plan periods, the Government initiated an evaluation mechanism to review programmes and policies under Sessional Paper No. 2 of 1992 in order to strengthen their implementation (ICEG 1998). An Action Plan on Policy and Strategy for Small Scale and Jua Kali Enterprises in Kenya was designed to achieve this. It included the improvement of mechanisms for policy and strategic implementation; assessment of the impact of such policies and programmes on target beneficiaries; improvement of the legal and regulatory environment and improving; designing and developing other support services vital to the sector; and MSE development (Kimuyu and Omiti 2000). However, though monitoring mechanisms had been put in place, the policies established for financial sector management were not fully attained (Mullei and Bokea 1999).

Stakeholders had also expressed concern that the sector lacked a clear policy on legal and regulatory frameworks, credit and finance, physical infrastructure, entrepreneurship and business development, marketing and technological policies, and gender and environmental concerns. Very little progress had been made in almost all the guidelines stipulated in Sessional Paper No. 2 of 1992. For example, regarding licensing, Karingithi (1999) observed that little progress had been made in the actual review of specific laws that governed the sector.

In supplementing government initiatives, microfinance institutions (MFIs) were established using either a Non-Governmental Organisation (NGO) or a savings and credit co-operative society's framework (Financial Sector Deepening (FSD) 2007). These institutions comprised important sources of credit for a large number of low-income households and MSEs in the rural and urban areas of Kenya (FSD 2007). However, they also operated without an appropriate policy and legal framework (GOK 2005). Even so, the Government recognized the need to focus more on these institutions to enhance their effectiveness in the provision of savings, credit and other financial services to the poor and MSEs. Therefore, an appropriate policy, legal and

regulatory framework to promote a viable and sustainable system of financing MSEs in the country was necessary (Kodongo and Kendi 2013). For that reason, the Government recognized the need for the development of new, inventive, and pro-poor modes of financing low-income households and MSEs who lacked collateral. Consequently, the Microfinance Act of 2006 was enacted (Kodongo and Kendi 2013).

After the 2006 Act was endorsed by the parliament, the Government set up the Youth Development Fund in 2006 as a deliberate move towards arresting unemployment among the youth (Kiraka *et al*. 2013). Later the Women Development Fund and Uwezo Enterprise Fund were established to finance different facets of MSEs and to enable this important sub-sector to support industrialization, employment and economic growth. The funds' objectives were to give loans to MSEs (YDF 2012). Irrespective of the distribution path used, the loan application in all the programmes followed a similar set procedure. For a group to qualify for a loan from any of the stated programmes, it must be registered with the Department of Social Services or the registrar of societies, at least three (3) months before applying for the loan, and must have an active bank account (YDF 2012). The group-lending mode adopted by these programmes contrasted significantly with the earlier initiatives adopted by the lending programmes like Rural Enterprise Fund which was created in 1991 and District Poverty Eradication Programme - rolled out in 2002, whose aim it was to increase productive capability of the borrowers by providing and promoting access to affordable credit to underprivileged communities ref.

Apart from the Government programmes, the group-lending model has been replicated by most progammes who has lent credit to MSEs in Kenya during the 1996-2006 period (Kodongo and Kendi 2013). The thinking behind this is the perceived prospect of alleviating credit problems among credit-constrained enterprises and poor households through this mode. Here, a number of entrepreneurs enter into a formal or informal contract which effectively makes them co-partners to loans, thus mitigating problems created by informational asymmetries[1] between the lender and borrower (Armendáriz de Aghion and Morduch 2000).

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[1]   Information asymmetry is the situation where at least one party to a contract has more or superior information than the other party(ies). Information asymmetry favours the party with superior information in contract enforcement (Stiglitz and Weiss 1981).

Despite the change of the policy, uncertainties abounded whether the mode adopted could alleviate the MSEs credit problem. For example, some historical studies on this area in other countries (Bangladesh, Bolivia and Indonesia) have found that many programmes could not sustain themselves without continuous external support (Morduch 1999), suggesting that if left on their own they could not survive for long. Fischer (2010) asserted that borrowers have a tendency to free ride on the indemnity provided by the group, implying that without additional contractual enforcement mechanism-group lending will fail. The assertion is that the future of micro-finance rests on the understanding of the "alternative mechanisms, reconfiguring them and combining them with new emerging ideas" (Armendáriz de Aghion and Morduch 2005 p.114). Given the above-cited concern, it is imperative for a research be done to evaluate whether the obstacles experienced by MSEs could have been eased by the group-lending mechanism.

2.4 The Problem of Credit in the MSEs in Africa

This section is intended to show that the problems MSEs experience in accessing credit is widespread and not particular to Kenya. The evidence provided indicates a general problem across Africa and by extension other developing countries in other continents. For example, it was estimated that only about 5% of farmers in Africa and 15% in Latin America and Asia had access to institutional credit and that, on average, 80% of loans went to only 5% of the population in developing countries (Swain 2001; Mpuga 2004).

Several reasons are thought to account for this scenario. First, formal institutions imposed relatively difficult conditions that ended up excluding MSEs from their services (Aryeetey 1998; Schoombee 1998). For example, a study done by Aryeetey (1998) reported that MSEs in Ghana and Zimbabwe were dissatisfied with the credit they received from both the informal and formal finance sectors. In Ghana for instance, Aryeetey (1998) reported that of 133 enterprises studied, inadequate finance turned out to be the most significant constraint for 53% of the firms. The study found that the smaller the enterprise, the more likely finance was a problem. Moreover, half of the financial problems were associated with inadequate working capital and poor access to credit for investment (Aryeetey 1998).

Schoombee (1998) asserted that the informal institutions thrived in South Africa because formal finance institutions were reluctant to supply credit to small enterprises. In an effort to minimise credit default by small enterprises, formal financial institutions screened potential borrowers to ascertain the risk of default and to develop various measures, including requirements of collateral, to make sure their credit was repaid. This process made the administration of credit costly to the formal finance institutions leading to discrimination against MSEs. In the same vein, although in a different economic development context, Coleman (2002) studied the constraints faced by female small business owners in the United States of America (USA) in which four thousand of such businesses were surveyed. The findings supported the view that lenders in the formal finance sector, for economic reasons, discriminated against small enterprises.

However, the formal finance sector cannot be totally blamed for discriminating against MSEs (Aryeetey and Gockel 1991; Coleman 2002). The constraint to obtain financial support could have been external to the firm, as in the case of discrimination, or the characteristics of the enterprise owners were not conducive to offering credit (Aryeetey and Gockel 1991). These characteristics may include business owners' low levels of numeracy, which Coleman (2002) argued hindered them from effectively communicating their financial needs to formal financial institutions.

Although, no known national surveys on financial literacy have been conducted in developing countries to support Coleman's (2002) assertion, Xu and Zia (2012), citing research done by FinScope, which focuses mainly on financial matters pertaining to small scale businesses, provides an insight into the level of financial literacy of micro entrepreneurs. In Ghana for example, a country comparable to Kenya in terms of development indicators, only 56% of small entrepreneurs used any kind of financial support including access to financial literacy. These figures could be compared to Mozambique and Zambia in which only 22% and 37% of business owners/entrepreneurs applied for any sort of financial support. These outcomes generally gave support to Coleman's (2002) hypothesis that lack of numeracy skill impended MSEs access to credit.

2.5 The Problems of Credit in the MSEs in Kenya

The role of MSEs in Kenya is well documented (CBS *et al*. 1999; GOK 2005). In spite of this contribution, an inadequate resource base had become a basic characteristic of most micro enterprises in Kenya (CBS *et al*. 1999, Atieno 2001; Bowen at al. 2009). For example, a study done in Nairobi by Bowen *et al*. (2009), found that out of 198 enterprises surveyed, 53% indicated lack of working capital as the main challenge to their growth. In addition, about 50% considered their business performance to be deteriorating and only a 2.5% considered their activities as very successful. The study also showed that 87.9% of enterprises was less than 10 years old, implying a likelihood of many enterprises closing down soon after establishment. Bowen's study finds support from a study (though not directly targeting MSEs but nevertheless which target the general population of Kenya) done by Mwangi and Ouma (2012) who reports that about 60% of adult population in Kenya is yet to gain access to any form of credit. Similarly, Moyi (2013) citing research results of the Kenya Integrated Household Budget Survey of 2007 indicate that about 4% of Kenyan households receive credit from commercial banks, 3.6% from micro-finance institutions and 4.3% from other financial institutions (GOK, 2007). This shows that it is only about 11.9% of the Kenyan households that have access to credit implying that financial deepening is very low.

Some of the important impediments were partly a result of unfavourable lending policies and development strategies, coupled with lack of an appropriate legal system to back up contract enforcement and lack of collateral to mitigate against information asymmetries (Kimuyu and Omiti 2000; Bowen *et al*. 2009). For example, Memba *et al*. (2012) opine that the issues and problems restraining SMEs from gaining access to financial services include lack of tangible security coupled with inapt legal and regulatory framework that does not recognize inventive strategies for lending to SMEs. Moreover, Memba *et al*. (2012) assert that MSES are perceived as high risk ventures and commercially unviable by formal financial institutions. As a result only a few SMEs access credit from formal financial institutions in the country

Three historical surveys conducted in Kenya clearly demonstrated this scenario. The NMSEB survey of 1999 showed that of the MSEs surveyed in 1993, 1995 and 1999; 85%, 89.2% and

89.6% had not received credit either from the formal or informal sectors. Given that credit facilities are integral to business growth, these percentages suggests that the MSE sector was credit constrained.

Similarly, supplementary studies undertaken by Kimuyu and Omiti (2000) and Mukiri (2008) revealed a wide disparity between actual and expected demand for credit. According to the study conducted by Kimuyu and Omiti (2000), about 90% of MSEs perceived borrowing as necessary for business growth. In addition, most of the entrepreneurs (88%) indicated their willingness to borrow to save their businesses from collapsing. Furthermore, about 97% of borrowers perceived borrowing to have a positive impact on their business and confirmed that they would continue to borrow to sustain their businesses. Yet, their study revealed that only 6% of the enterprises applied for credit and about a third of the enterprises closed down due to lack of working capital. The hypothesis that MSEs were credit constrained is also supported by a subsequent study conducted at Kasarani Division of Nairobi City in Kenya by Mukiri (2008). The study indicated that out of 218 small-scale manufacturing enterprises, only 7.8% had accessed bank credit in the one year preceding the study period.

Based on the three MSE surveys, it is possible to make the following two inferences. First, the majority of enterprises between the period 1996 and 2006 (the period of the research) did not demand credit even when they needed financial support; about 90% of the enterprises did not borrow even though a third of enterprises closed down due to lack of working capital. Second, the supplementary survey revealed that of the total number of MSEs who applied for credit, about 83% were successful, meaning that there was a high probability of success for those who applied for credit. It could therefore be interpreted that the high success rate implied the entrepreneur's decision to apply for credit was mostly based on self-assessment, where they evaluated the probability of success before tendering an application to the lender. A loan application also involved a cost which implied that the majority of the borrowers could not apply for credit if they perceived the chance of obtaining the loan to be very low.

Atieno (2001) also reported a similar finding as their results highlighted that out of 334 respondents surveyed in rural Kenya, 85% were credit constrained. Even so, only 49% of the respondents applied for credit, out of which 15% were unsuccessful. This implied that unsatisfied need for credit was widespread in both the informal and the formal sectors, implying that the credit packages available at the time did not serve the needs of all entrepreneurs seeking to expand their businesses.

2.6 Conclusion

The universality of the studies (Kimuyu and Omiti 2000; Atieno 2001; Mukiri 2008; Bowen *et al*. 2009) indicates that over 90% of enterprises did not receive credit and when they did, they were rationed despite their positive perception towards credit. The common outcome from these studies is that lack of credit access was an upshot of acute institutional impediments that arose from information asymmetries; unfavourable lending policies and development strategies, coupled with lack of an appropriate legal system to back up contract enforcement, and lack of collateral to mitigate information asymmetries in credit markets in Kenya. The studies implied that part of the financial problem MSEs encountered stemmed from financial policies adopted by the government and other lenders, which in effect favoured large, formal institutions and discriminated against small firms. In brief, the credit packages available at the time did not serve the needs of all entrepreneurs seeking to expand their businesses - a problem clearly captured in the Sessional Paper no. 2 of 2005 (GOK 2005).

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. Previous government policy documents (as stated in Section 2.3) attest to this, stating it was imperative for the Government to regulate the market – through policy guidelines and direct intervention to make this important sector to grow. It is, therefore, reasonable to deduce that the change was essential at that time to assist this sector. The question of whether the adopted change was appropriate to mitigate the obstacles encountered by MSEs is contextualised in the subsequent chapters.

CHAPTER THREE

HISTORICAL DEMAND FOR CREDIT BY MICRO AND SMALL ENTERPRISES IN KENYA

3.1 Introduction

Since the main thrust of this thesis to examine if the change in the lending policy had any theoretical or empirical support during the 1996 – 2006 decade, it follows logically to ask whether the demand and supply rigidities experienced by MSEs in the credit market could have been mitigated by a group mode of lending. To answer this question, the study investigated the critical factors which prevented MSEs from demanding credit, despite the critical role such a request played in promoting their expansion and survival. These rigidities were evidently captured by the MSE baseline survey conducted in Kenya in 1999 which indicated that about 90% of the MSEs that were surveyed did not demand any sort of credit from the formal or the informal financial sector. Therefore, estimating the strength of factors (which affected demand for credit) enables the researcher to deduce whether group lending would have mitigated them. Moreover, the theoretical and empirical analysis of factors that influenced MSEs to demand credit was quite limited and still remains a challenge to-date. The current chapter also strives to augment the existing studies by compiling theoretical and empirical evidence that underpinned the reasons MSEs demanded low amounts of credit.

The remainder of this chapter is organised as follows: Section 3.2 gives the theoretical and empirical perspectives explaining MSEs demand for credit; Section 3.3 describes the sources of data and outlines the method of analysis. Section 3.4 presents and discusses the results, while Section 3.5 concludes this chapter.

3.2 Factors which Influenced Credit Application by MSEs

As noted in the previous section (Section 3.1), the literature underpinning the reasons MSEs demanded low credit remains a challenge. This is not a new phenomenon, as Swain (2002) reported to have experienced similar challenges more than a decade ago when she investigated MSEs demand for credit in Puri region of India. The reason underlying this scenario is that most academic inquiries in this area investigated a range of issues concerning credit rationing, with little effort directed towards understanding the demand side of the market. The reason was

apparent; most previous studies tended to assume a positive demand for credit with a constrained supply side of the market (Stiglitz and Weiss 1981; Carter 1988; Ghosh *et al*. 2000). But, only focusing on the constrained supply side of the market without determining whether or not the enterprise had a positive credit demand, made it impossible to acknowledge which enterprises were credit rationed and which were not. For this reason, it is important to examine whether anything can be learnt on the demand for credit.

3.2.1 Theoretical explanations for credit demand

Anecdotal evidence suggests a number of reasons why MSEs did not demand credit despite its potential importance in their business development. The reasons suggested boil down to analysing possible characteristics of enterprises which had a low probability of demanding credit (Swain 2002). Nevertheless, a historical survey of the studies done in this area point to the absence of concrete theoretical arguments that underpins the reasons. The current study intends to contribute to these reasons by critically examining two theoretical dispensations and their relevance. The first theory of credit rationing hypothesised that the actual demand and the amount of credit demanded was influenced by the potential borrowers' perception of a successful application (Muth 1961, Fischer 1980). It posits that entrepreneurs were not entirely ignorant of the possible outcomes of their decisions, and based their decisions on previous experience and other information. If, for example, a firm's perception that the probability of them accessing credit was zero, they would most likely not apply for credit. The reason for this was because a credit application involved incurring some costs which they would not want to bear if they were not successful in receiving credit.

The second theory is the economic theory of intertemporal consumption which seeks to explain an enterprise's preferences in relation to consumption over a period of time (Ando and Modigliani 1963, Browning and Lusardi 1996). According to this theory, consumers intertemporally reallocate their income over time to maximise lifetime utility. The theory contends that the effective reallocation of the stream of income between different periods of time is not easy and sometimes is beyond the ability of many entrepreneurs.

Credit rationing theory

Normally, the price (i.e. the interest rate) is expected to equalise the quantity demanded and supplied. Nonetheless, this idealised credit market where loans were traded competitively and the interest rate was solely determined by the market found little relevance in developing countries (Stiglitz and Weiss 1981). Consequently, their credit markets did not clear. These dysfunctional markets produced outcomes where lenders were unwilling or unable to charge each customer an interest rate commensurate with the borrower's risk class (Stiglitz and Weiss 1981). Two reasons were given to underpin that state of affairs. In the first instance, the prevalence of information asymmetries in these markets made lenders unable to *ex ante* distinguish the risk type of a borrower within a class of borrowers (meaning the lender cannot be able to set different loan prices). Consequently, the odds of lenders giving credit to borrowers who were at risk of not repaying the loan Second, the same information, coupled with weak contract enforcement mechanisms, prevented the lenders from monitoring the performance of the financed projects and enforcing credit repayment of the loan given (Carter 1988).

Given the predicament, lenders could have been motivated by the idea of increasing the interest rate to maximise expected returns from the "good re-payers" and recoup losses arising from "poor re-payers". Equally, this action was counterproductive in two ways; first, the interest rate charged by the lenders could have affected the riskiness of the lender's portfolio (Stiglitz and Weiss 1981). If the lender posted a high interest rate that reflected the average risk of the borrowers in the market, it could have drawn a disproportionately large share of loan applications from less creditworthy borrowers while causing low risk borrowers to drop out of the pool of potential borrowers, an outcome which could have affected the expected credit repayment (Stiglitz and Weiss 1981).

Stiglitz and Weiss (1981) captures this scenario by proposing that rationing was a likely outcome in the credit market in developing countries because lenders could not get adequate information on borrowers. The authors contended that though a lender could have utilised the interest rate which the borrower was willing to pay to act as a screening device, a higher interest rate on average may have decreased the expected credit repayment by reducing the pool of borrowers. The assertion is that if the lenders increased the interest rate, it could have compounded the

probability of non-payment by increasing the risk composition of the financed projects. This adverse selection[2] occurred because borrowers who were willing to borrow at a higher interest rate had high-risk projects whose ventures were unlikely to pay off. However, if they did, they could have paid off at a higher rate of return than the lower interest rates. Again, a higher interest rate could have led 'safe' borrowers with low project return exiting the market, since the possible payoff of their projects was too small to pay the higher interest rate. A similar argument was advanced by Carter (1988), who argued that after a particular critical interest rate, the average characteristic of a borrowing group tended to deteriorate, which in turn led to low lending profitability.

According to Stiglitz and Weiss (1981), high interest rates also affected the borrowers' actions by influencing the level of 'effort' which was directed toward the success of the financed project. This line of thinking was succinctly captured by Ghosh *et al*. (2001: 285) who asserted that "high interest rates cause the problem of *debt overhang* - a highly indebted farmer (lead borrower) has very little stake in ensuring a good harvest (good project returns)". The assertion behind this idea is that large loan repayments mean that the borrower captures a small portion of the returns which consequently reduces his effort. Keeping this in mind, lenders were reluctant to raise their interest rate beyond some levels. As a result, lenders were unwilling to raise their interest rate to correspond with the perceived credit riskiness of the borrowers (Ghosh *et al*. 2001).

As lenders could not differentiate the type of borrowers *ex ante* and could not increase the interest rate, they ended up relying on *ex ante* characteristics of the potential borrower (a process which still could not give adequate information due to information asymmetry (Stiglitz and Weiss 1981). This effectively implies that, depending on the observable characteristics, the lender could give full credit to some MSEs while rationing credit to others.

The above argument leads to another general question: why were lenders not enthusiastic about the borrowers' provision of collateral so to safeguard their interest against problems associated with market information asymmetries? It is known that provision of collateral minimises

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[2]   The risk of adverse selection arises when a borrower had some inherent characteristics that could not be observed by the lender but affected the borrower's ability to repay the loan (Stiglitz and Weiss 1981).

repercussions of information asymmetries by supplementing the assessment of the borrowers' credit worthiness and by increasing the risk-adjusted returns on the loan given. The foundation is that no rational borrower can be willing to offer his assets[3] against a loan which he has no intention of repaying and second, the prospect of losing their pledged collateral motivates borrowers to work hard towards the success of the project financed. However, despite this knowledge, lenders were aware that MSEs were "always under collateralized in the sense that the net value of their collateral to the lender is less than the principal plus interest" (Carter 1998 p. 84). The outcome therefore reduced the importance of collateral in developing countries.

Furthermore, as Beck (2000) noted, weak and inefficient legal mechanisms in developing countries made the disposal of collateral a herculean activity, translating into great cost to the lender. The outcome arising from inadequate loan security on the side of the borrower and weak credit enforcement implied that lenders incurred most of the cost in cases of credit default. Viewed against the backdrop that all the project earnings above the required repayments accrue to the borrower; and given that this knowledge is privy to the lender, the outcome is at some level of discrimination against some borrowers. This, by implication, means that constrained access to financial support from lenders could have been external to the firm as in the case of a discrimination constraint, or could have been internal representing characteristics of the enterprise or enterprise owners (Aryeetey and Gockel 1991).

Craigwell and Jefferey (2010) similarly contended that lending institutions evaluate the prevalence of other factors which may limit the borrower's ability from repaying credit before making lending decisions. They argued that in times of economic recession, lenders are very cautious in approving credit. Although their argument differs slightly with Stiglitz and Weiss (1981), it complements the argument that lenders evaluated the likelihood of enterprise repaying credit based on the prevailing economic status of the country and intra-firm characteristics like their asset base, turnover and age of the firm.

The above theoretical proposition can be applied to explain the previous formal credit market outcomes among MSEs. As previously noted in the first two chapters, most formal financial

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[3]   Mostly lenders undervalue the true price of collateral implying that borrowers are greatly disadvantaged in case of default.

institutions preferred lending to the government and big business institutions which, in their opinion, were less likely to default (Oketch *et al*. 1995). Since business enterprises competed for the same "loanable" funds from the finance institutions, the public sector ended up crowding out private investment as firms and the government competed for the limited funds. This problem was inflated by the domination of the financial market by a few major commercial banks who, apart from targeting the less risky class of borrowers, were also lenders of short-term credit (Onsando 2008). The net outcome of those scenarios was that MSEs, being disadvantaged in terms of the opaque nature of their operations (leading to information asymmetry) and their state of under-collateralisation, were on average more likely to be credit rationed than large enterprises (Kimuyu and Omiti 2000).

As entrepreneurs were not entirely ignorant of the possible outcomes of their decisions, and basing their decisions on information which was in their domain and past experiences; they could guess the future credit outcomes. If a firm perceived its probability of accessing credit as zero, the most rational behaviour was for the firm not to apply for credit. The theory of rational expectation espoused by Muth (1961) and later by Fischer (1980) succinctly captured this scenario. They illustrated the various economic outcomes which were influenced by the economic agents' perceptions. Their assertion was based on the principle of the standard economic premise that hypothesized that economic agents act in ways that maximise their utility over time and will base their present decisions on the future prospect. They asserted that expectations and outcomes were mutually enforcing and people, in forming their perceptions, strive to guess what will actually happen. Moreover, they argued that when people focus on a particular occurrence over and over again, the most probable scenario is for them to adjust and reduce avoidable errors. Hence, they argued that a continuous repeated feedback from 'precedent' outcomes to 'present' prospects improved the accuracy of the focused outcome. This, by implication, meant that the actual demand and the amount of credit demanded depended on previous outcomes.

Economic theory of intertemporal consumption

When investigating a consumer's income spending overtime, a rational starting point is to ask what people's goals are in life. Most people seem to have two main goals in life. First, many favour a higher standard of living to a lower standard, meaning that many people want to

maximise their income earned. Second, they want to smooth or spread out their income over a lifetime, implying that they do not want to live a comfortable life in one period and then live in poverty in the next stage of their life. The theory of intertemporal consumption tries to explain the latter and, by implication the reason MSEs failed to demand credit.

The theory posits that people can effectively reallocate their income over their lifetime. That is, people whose income is low in early stages of their life borrow against future expectations of higher income, under-consume in middle age (which allows them to repay the borrowed monies when their income was low and save for their pension/retirement days) so they have money to spend when their productive capacity diminishes. Although this premise is being widely debated, a more "recent" line of argument hypothesizes that income reallocation is not as easy as the theory of intertemporal consumption suggests (Soman and Cheema 2002). The view given is that intertemporal income reallocation involves making difficult decisions that are sometimes way beyond the ability of start-up entrepreneurs in developing countries (Soman and Cheema 2002). This section therefore presents an overview of the intertemporal theory and its importance in explaining why MSEs did not demand credit.

In their seminal paper of 1963, Ando and Modigliani (1963) argue that people consume an annuity of their expected income at all points in their lifetime. They posit that consumers try to maintain a particular level of consumption even though their income and wealth may fluctuate. In particular, young consumers, due to their limited or non-existent savings, often borrow against their future earnings to smooth their current expenditure. Therefore, the success of intertemporal reallocation of resources requires the existence of agents who are both willing and able to lend credit against future repayment, or for consumers, on the other hand, who are low-income earners to demand credit to support their current consumption.

Similarly, Browning and Lusardi (1996) argued that rational astute agents attempted to keep the marginal utility of expenditure constant over time. They asserted that agents simultaneously consider both short-term and long-term consumption in their decision-making and would not want expenditure to be worth more (in discounted utility terms) in one period than in another. Considering that the marginal utility of expenditure and expenditure itself are monotonically

related, agents sought to balance the marginal utility of money from one period to the next and from now and the future (Browning and Lusardi 1996). For this to happen, there must be perfect credit markets where young people could borrow to finance some consumption in early periods of their life and equalise the marginal utility of expenditure over time.

Although the prior historical arguments mainly explained individual consumption behaviour, the principle points to MSEs' past credit consumption behaviour of MSEs in Kenya. The use of the economic theory of intertemporal consumption is appropriate for this analysis due to the following consideration: By their nature, MSEs' previous decisions on consumption, production, employment and investment were intertwined with household decision-making; implying a general difficulty in distinguishing enterprise's activities from household activities (CBS *et al*. 1999). Moreover, these enterprises were also started as a means of providing income and employment opportunities for members of the household (CBS *et al*. 1999) hence most MSEs used family members as the main source of labour. In this regard, it can be assumed that any decision concerning consumption, investment and labour supply was determined by the head of the household.

Given MSEs mismatch between "present" income and the stream of their desired expenditure, it is reasonable to assume that MSEs reallocated their expected future income over time to smooth their "current" expenditure. Even so, research has found evidence indicating that there was a discrepancy in MSEs' predicted and actual behaviour (Kimuyu and Omiti 2000; Atieno 2001; Mukiri 2008) in that 'fledgling' MSEs drastically under-consumed in early stages in their existence by failing to borrow against their future earnings (Courant *et al*. 1984). The issue therefore is, why was this the case?

Although it is difficult to explain this behaviour because of the paucity of literature available[4], a critical analysis of the key assumptions contained in the theory of intertemporal consumption can shed some light on the issue. The generally accepted assumption that economic agents can effectively reallocate their income over their life-time might not hold true in some circumstances

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[4]   A thorough search of intertemporal allocation of income among MSEs revealed a paucity of information. The data base at that time was evidence that no much info was available.

as such assumptions have been invalidated by past empirical evidence in developing countries (Soman and Cheema 2002). In these economies, apart from imperfect credit markets, the idea that agents had a positive demand for credit in the early stages of development to finance their consumption and investment expenditure is far-fetched (Lusardi and Mitchell 2011). Reasons advocated range from lack of adequate knowledge required when applying for credit to an apparent lack of need to apply for credit (Lusardi and Mitchell 2011).

A number of historical studies have analysed the basis of competitive advantages in decision making, which by implication can partly explain the inadequate credit demanded by MSEs. Barney (1991), a proponent of the Resource-Based Theory - which tries to explain reasons why some firms may have a competitive advantage over another, argues that apart from their tangible attributes, information and knowledge that are controlled by the enterprise are critical in conceiving and implementing strategies to improve their effectiveness. Russo and Fout (1997; citing Grant (1991) classify a firm's internal resources as that which consists of tangible, intangible, and person-based. The tangible resources include financial and physical resources; intangible resources include reputation and technology; while person-based resources include employees' culture, their training and expertise as well as their commitment and loyalty. But, for the tangible and intangible resources to work, the firm has to be organised and the people have to be managed. (Russo and Fout 1997).

The role of entrepreneurship and/or management in the organisation of the business can therefore be another unique source of competitive advantage. The organisation aspect of a business depends on the entrepreneurship orientation (defined as the decision-making styles of a firm -an intangible capability) which entails risk-taking, innovativeness and proactivity. This orientation defines the type of drive motivating entrepreneurs to start their own business ventures. For example, when Parrish (2010), explored the incentive underpinning the start-up of the businesses, he found two broad calibres of entrepreneurs; sustainable and opportunity driven. According to Parrish, sustainability-oriented entrepreneurs have the primary objective of sustaining the business, where the profitability of the business is a means to that end. This contrasts with the opportunity-oriented entrepreneurs whose profitability is the end in itself and whose motivation is by having profitable entities.

By drawing on experience from four cases, Parrish concluded that the organisational design adopted by sustainable-oriented entrepreneurs deviated from the design adopted by opportunity-orientated entrepreneurs. He specifically mentioned strategic planning, qualitative management, resource perpetuation and the worthiness as the hallmark of sustainable driven entrepreneurs (Parrish 2010). Hall *et al*. (2010: 445) argued that these are features which arise within a unique organisation process "that places increased weight on the extension of resources far into the future" – a trait which differentiates the sustainable entrepreneurship from others. This implies that sustainability-oriented entrepreneurs are more inclined to demand credit than their counter-parts as they are more inclined to reallocate income over a long term.

In as much as this may be the case in developed countries, entrepreneurs within developing countries were more in the 'opportunity-oriented' category where priority was given to the immediate returns and profitability of start–up businesses. This thought process may link to the reality that many MSEs were started at the first opportunity by families with meagre family resources including finance. These restrictions impaired micro entrepreneurs' ability to think strategically in the long-term - the premise of intertemporal consumption theory. (Hall *et al*. 2010).

Similarly, a critical element of organising which also depended on the calibre of the entrepreneur and/or management is the capacity to link these internal strengths (resources) with the opportunities available in the external environment (Russo and Fout 1997). Availability of bank credit can be said to constituted one such opportunity. On the same line of argument and in support of the premise that the MSE's competitive advantage is embedded in the intangible assets it possesses, Wiklund and Shepherd (2003) argued that, with appropriate knowledge and information, MSEs owners are able to take risk, plan and make decision needed when acquiring resources. He argued that these managerial aspects defined the entrepreneurial orientation that the MSE had towards decision-making (which applied to decisions concerning demand for credit).

Other contributors to the resource-based view of an enterprise have classified the resources as property-based and knowledge-based (Kimuyu and Omiti 2000, citing Wiklund and Shepherd

2003; Zeller 1994). They argued that even where tangible resources are available to all the firms in an industry; intangibles are firm-specific, hence a potential source of having a sustainable competitive advantage. According to this theory, as noted by Russo and Fouts (1997), the sources of a firm's superior performance are located inside the firm itself. It can, therefore, be construed that inadequate critical resources affected MSEs' quest for credit.

As noted by Soman and Cheema (2002), many consumers of credit are generally unable to correctly value their future income and they also lack the cognitive competence to resolve the intertemporal optimisation difficulty essential to the life-cycle theory. Under this theory, consumers are required to value their inflation-adjusted income subject to their various constraints and this really requires a fair degree of computational prowess which is mostly taken for granted in the theory of credit demand. Given that most MSEs were generally operated by people who had little formal education, and as such low levels of numeracy (CBS *et al.* 1999), the credit application process would have been a potentially intimidating experience for them (see Lusardi and Mitchell 2011). This aspect would have hindered them from effectively communicating their financial needs to formal financial institutions (Coleman 2002). The basic implication is that personal attributes of the enterprise owners ultimately determined whether an MSE demanded credit or not.

In addition, it was very difficult to project the future earnings in the presence of risk and uncertainty. Many MSEs encountered a multiplicity of problems which made them prone to future risk and uncertainties. As it was, most of those enterprises operated in non-permanent structures, sometimes without even a trading license (*CBS et al.* 1999) and remained prone to the vagaries of market fluctuations. As a result, borrowing money, as Soman and Cheema (2002: 35) argued, required these firms to "compute alternative income scenarios, assign probabilities of each scenario and compute a most likely income stream". This requirement was beyond the capacity of many entrepreneurs. For example, Lusardi and Mitchell (2011) showed that in the USA, people lacking high school education are likely to answer questions incorrectly, and also tend to shun answering questions directed at them.

Monticone (2010), using data from Italy, showed a positive relationship between financial literacy and wealth accumulation. Behrman *et al*. (2010) using an instrumental variables regression model showed a similar relationship, but in USA. The insinuation is that MSEs' meagre wealth accumulation is directly correlated with the financial literacy levels of their owners. Since the life-cycle theory hypothesis is also based on the premise that the consumption/expenditure changes greatly with income, wealth, age and other socio-economic conditions during various stages of an entrepreneur's life, the demand for an economic asset by an economic agent is therefore expected to be a function of earnings or wealth. This, in turn, correlates with the attributes of a firm and the firm's owner. It is in this case that an enterprise attributes would not only affect wealth and income but also the demand for credit.

3.2.2 *Demand for credit – An empirical review*

Just like the theoretical aspect of this scenario (as discussed in Section 3.2.1), the empirical historical support for low credit demand by MSEs is quite limited. Nonetheless, the few studies undertaken in this area tended to corroborate the theoretical *a priori* proposition that a firm's characteristics determined the probability that they would demand credit.

Available studies generally adopted three broad lines of investigations that depended on their treatment of the interest rate variable. Some excluded the variable as a determinant of credit demand in their estimation (Baydas *et al*. 1994; Manrique and Ojah 2004; Okurut *et al*. 2005). Other studies treated the interest rate as endogenous variable determined within the estimation model (Iqbal 1983; Swain 2002; Mpuga 2004), whilst the third category of studies captured the interest rate as an exogenous variable (Kimuyu and Omiti 2000; Atieno 2001; Oni *et al*. 2005).

The first line of enquiry excluded the interest rate as a determining factor for credit demand by assuming that the interest rate was fixed at some level by the credit market and individual lenders just adopted the rate as given (Stiglitz and Weiss 1981; Carter 1998). Against this background, Okurut *et al*. (2004) investigated the household and individual characteristics that acted as determinants of both the demand and supply of formal and informal credit in Uganda (Uganda

bonders Kenya and it has the same socio-economic characteristics). To determine the factors which affect MSEs demand for credit, they utilised a data source derived from a sample of 10 695 households contained from a national household survey done in 1999/2000. To model this relationship, they used a dataset that contained questions not only on actual credit demand (captured as a dummy variable[5]), but also on loans for which they had applied. They observed household and individual characteristics and employed a Heckman two-stage selection model (a statistical model which allowed the researcher to correct for selection bias), to separate the selection model (that is, to separate who had applied for credit) from the amount of credit for which was applied. They found that a number of variables played a significant role in credit demand, and that the result most fitted *a priori* expectation. At the national level, an adult's age, education (proxy by the number of years the head of household had formal education) and household expenditure levels were found to have a significant and positive effect on the credit demanded.

Baydas *et al*. (1994) outlined the factors affecting credit demand among MSEs in Ecuador. Their study revealed that a demand for a credit was significantly related to both the assets and profits of a business. Assets, as a proxy for the size of the business, and profit, as a proxy for business success encouraged entrepreneurs to demand credit. Another factor that was found to influence an entrepreneur's demand for credit was the number of years they had been running their business, the type of business and business ownership.

Manrique and Ojah (2004) utilised multivariate probit analysis to model the demographic factors that affected credit demand in Spain. Their argument rested on the premise that the interest rate was commonly set by forces outside the borrower-lender control which made it an exogenous variable. Their results showed that permanent and transitory income, the number of members in a household, the age and gender of the household head and regional differences (geographical location) affected credit demand. In general, their results suggested a potential for growth within the credit market based on an increase in income and changes in social and demographic factors.

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[5] Dummy variables are used in this study to differentiate different outcomes

In India, where there is a different facet to credit access in rural areas, Satyasai (2012) demonstrated the existence of differential access to credit across farm-size classes (the size of household land holding). Using survey data and multiple regression frameworks which employed a variety of dummy variables, Satyasai found a positive correlation between farm-size classes and demand for credit, that is, the smaller the size of the farm, the lower the demand for credit. Even though this study targeted rural farmers, its relevance is not lost in the bigger picture.

The second category of studies treated the interest rate as an endogenously determined explanatory variable. The general argument, which underlined this consideration, is that the rate of interest a firm was charged was a product of intra-firm attributes. Thus, lenders charged interest depending on their perceptions of the firm's risk probabilities. Iqbal (1983) for example, set up a household model to investigate the borrowing behaviour of farm households in India. His analysis consists of two equations which were estimated simultaneously; the first equation estimated the demand function which utilised intra-firm attributes while the second equation captured the interest rate as an endogenous variable. Using a comprehensive national panel survey of approximately 3 000 households, Iqbal highlighted that transitory income calculated as the difference between current income and permanent income (where the latter is calculated as weighted average income over the last three months) was found, as expected, to be negatively and significantly associated with credit demand. The study also found that borrowing was determined by farm-specific endogenous interest rates which were linked to personal and location characteristics. Farmers in a position to benefit from technological change were found to borrow more credit, and attracted lower interest rates from the lenders. Iqbal's study can be credited, not only for his attempt to include interest rate as an endogenously determined variable interest rate, but also his efforts to incorporate the interaction between technical change and the rural finance market. However, the study suffers from its inability to model different sources of credit and also he did not include non-borrowers in his analysis.

Likewise, Swain (2002) formulated a Type 3 Tobit econometric model to investigate the role played by various household characteristics in relation to the amount of credit demanded. The broad conclusions based on Puri District Level Data from India were that household characteristics, like net worth, family size, the dependency ratio and the primary activity of the

head of the household were important determinants of demand for credit. In addition, the price of output and the location of the household were also found to be significant. The study, nonetheless, suffers the limitation of assuming a single source of loans/credit for the household, whereas in reality, a household could access credit from a variety of sources.

Mpuga (2004) used Probit, Multinomial Logit and Tobit models to determine three aspects of the demand for credit in rural Uganda. The study gave support to the findings that household characteristics and location characteristics strongly affected the demand for credit, an indication that credit demand depended on the overall need for credit and ability to repay. The same attributes determined the amount of credit demanded. The study can be credited for recognising the endogeneity of interest rate in the estimation.

The third type of study assumed the lending rate to be determined by factors exogenous to the characteristics of the borrowers. The studies postulated that different lenders set different rates (depending on the lenders' perceptions on the borrowers' credit worthiness) which were applied uniformly to borrowers who demanded credit from them. Kimuyu and Omiti (2000) for example, estimated a logit model of credit applications behaviour in Kenya and discovered that the demand for external finance was influenced by a combination of enterprise and entrepreneur attributes. Older, more educated entrepreneurs operating older, larger and registered enterprises were more likely to apply for external credit. This is corroborated by Atieno (2001), whose findings in the same country indicated that the size of the household, number of business owners and employees, the owner's gender, business revenue, income, age of business and assets influenced credit applications. Similarly, Oni *et al*. (2005), analysing the data from a survey they undertook on rural households in Nigeria, found with the aid of the probit model that education, proximity of the nearest finance provider, income of the farmers, and the use of fertiliser were significant determinants for the demand for credit, while gender, age, marital status, farm size and the interest rate were insignificant.

Similar to Mpuga (2004) study, Hashi and Toci (2010) evaluated MSEs apparent lack of credit demand (which they referred to as self-imposed credit rationing) and concluded that an

enterprises characteristics, including firm size, age, performance and ownership have a significant effect on an enterprises' intentions to apply for credit. By utilizing data provided by a survey in South Eastern Europe, they found that small enterprises are less likely to apply for credit than big enterprises.

3.2.3 Overview of the literature

Trying to answer the question of what coursed low credit demand generates quite a number of theoretical and empirical arguments. These arguments have been grouped into two categories. The first category focused on the costly state of credit process verification caused by asymmetric information prevalent in the credit markets, which led to some firms being credit rationed. Given the limitation of interest rate as a market 'clearing' instrument, a profit-maximising lender could not necessarily increase the cost of credit to correspond with the risk, as they would have had to maintain a fixed rate of interest, and at times ration credit to some borrowers depending on the enterprises' observable characteristics. Therefore, as lenders evaluated the firm based on their *a priori* observable characteristics, intra-firm and owners' attributes played a determining role - a position corroborated by various past empirical studies (Kimuyu and Omiti 2000; Atieno 2001; and Oni *et al*. 2005). The subsequent argument focuses on the inability of many MSEs to allocate income over time, which subsequently reduces their ability to demand credit.

3.3 Research Methodology

This Section gives the methodology utilised in this chapter.

3.3.1 Sources of data

As previously mentioned in Chapter One, this study (Chapter Three) utilises quantitative secondary data derived from The *National Micro and Small Enterprises Baseline Survey* 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. Consequently, the general objective of the survey was to update and expand the information generated from previous surveys done in 1993 and 1995. The survey used household as the basis of determining and identifying those economic units that were to be interviewed in detail. The survey employed a relatively structured and standardized questionnaire (see Appendix 1).

The objective of the survey was to determine the extent and structure of the sector by estimating the total number of MSEs, and their contribution towards employment and income. In addition, the survey analysed issues of entrepreneurship and business features in the background of demand and supply of business support services. The survey also used the National Sample Survey and Evaluation Programme (NASSEP) III Sampling Frame developed by Central Bureau of Statistics from the Kenyan 1989 Population and Housing Census. NASSEP III is a two-stage stratified cluster sample design with individual districts forming the stratum. In the creation of the NASSEP III sampling frame, the first stage of sampling involved selection of enumeration areas (EAs) from the 1989 population census, with the actual sample size in each stratum estimated through the use of the 1993 MSE survey figures.

To ensure the survey had national coverage and representation, the country was first subdivided into four heterogeneous main strata. The first stratum comprised of Kenya's two biggest cities, Nairobi (capital city) and Mombasa (the second largest city), which were considered similar in commerce and demography. The second stratum consisted of towns with over 10 000 inhabitants based on the 1989 census, while the third stratum consisted of smaller towns with a population of between 2 000 and 10 000 people. The fourth stratum comprised of the rural areas. To ensure appropriate representation, the rural stratum was further sub-stratified into four agro-ecological zones so to take into consideration the diverse economic and demographic characteristics. In total, 14 408 households forming 144 sampling clusters of about 100 households each were surveyed

The baseline study used household samples as the foundation for determining and identifying those units that were interviewed in detail. The survey covered all economic actions performed by family members, whether as an employee or self-employed worker. Where the main activity was identified as non-agriculture and the member self-employed or employer, then they were asked to complete the full questionnaire that requested them to answer questions on their main responsibilities as well as any other secondary activities undertaken by the individual. Similarly, where the individual was a dependent worker (employee, unpaid family worker, or apprentice),

then the emphasis was put on the secondary activity performed on a self-employed basis, thus being able to achieve complete coverage in the survey questionnaire.

3.3.2 *Validity of the data*

It is generally known that sources of information used in research activities should be from the recent past. The rule of thumb suggests that data should not be more than five years old and in some cases, very recent data is required. However, it is not always possible to have recent studies to suit the breadth and depth of the intended analysis. For that matter, the reliability and validity of the data cannot be entirely based on the age of the data, but on other parameters as well. As indicated earlier, this thesis (Chapters Two and Three) uses data derived from a national baseline survey conducted in 1999. A considerable period of time has since elapsed. The question, therefore, is whether data derived from a survey conducted 15 years ago is still valid.

To discuss the appropriateness of this data in the current thesis, perhaps the starting point is to ask what the essential consideration is in assessing the suitability of the data. It is argued that the first thing to consider is the credibility of the data source. An institutional source is assumed to be more credible than individually collected data as it is thought that institutions have higher financial capacity to mount a credit survey in terms of personnel and equipment. The current study employs a baseline survey conducted jointly by the Central Bureau of Statistics (CBS) currently renamed Kenya National Bureau of Statistics (KNBS) in collaboration with International Centre for Economic Growth (ICEG) and Kenya Rural Enterprise Programme (K-REP). KNBS is the principal agency of the government for collecting, analyzing and disseminating statistical data in Kenya and maintaining a comprehensive and reliable national socio-economic database. ICEG and K-REP are international NGOs. Therefore, the credibility of the data is not in dispute.

The second consideration undertaken in selecting this set of data is based on the importance attached to the process used in gathering the information. KNBS maintains NASSEP, which provides the structure for designing household studies to produce diverse forms of household based statistics. It maintains a Master File of all establishments in the country. This Master File provides a framework of collecting establishment based data. In addition, KNBS has an elaborate

infrastructure for data collection, which includes District Statistical Officers and trained data collectors in every district. This mechanism from the national to grass roots level enables KNSB to collect thorough and credible data.

The third consideration, in as much as the data is old; serves the purpose of this study. From the onset, this is a historical analysis covering the period 1996 – 2006. 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.

3.3.3 Data description

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 1 876 enterprises. Of this total, 37% of the enterprises came from the first stratum comprising of Kenya's two biggest cities, Nairobi and Mombasa; 25% of the enterprises came from the second stratum consisting of towns which had a population of over 10,000; while the third and fourth stratum, that consisted of smaller towns and rural areas had 14% and 23% of the enterprises respectively. Notwithstanding the centrality of credit in enterprise growth, the overall demand for credit in Kenya was low, as only 6.4% of all MSEs reported having demanded credit. This is corroborated by the number of enterprises (80%), which reported using family savings as the main source of start-up capital.

For intertemporal consumption premise to work, entrepreneurs are supposed to reallocate their stream of income over time (Ando and Modigliani 1963); Browning and Lusardi 1996). These reallocations require a high degree of analytical aptitude, however, only 2.8% of respondents had attained college level education; 40.1% had attained secondary education while 48.5% had a

primary education and 8.7% of the entrepreneurs who owned MSEs had no formal education. The overall number of schooling years averaged 9.15 years which meant that many entrepreneurs did not have the education required to make such decisions. Considering that primary and secondary schooling is considered basic education, entrepreneurs with only this level of achievement were likely to have a lower ability to reallocate resources across their lifetimes, a precursor for low credit demand. This finding is inconsistent with Lusardi and Mitchell's (2011) study in the USA where education level was found to significantly influence MSEs credit applications as people with low levels of education found it intimidating to apply for credit from formal financial institutions.

In addition, many entrepreneurs (64.3%) did not keep business transaction records which meant that they did not possess records against which they could borrow and only 24.3% of the firms operated a bank account. These percentages may indicate the apathy most of these business owners had towards the formal financial sector. This finding is supported by a survey done by Monticone (2010), who found a positive relationship existed between literacy and the accumulation of wealth. Similarly, Hall *et al*. (2010) argued that an entrepreneur's orientation is also important in applying for credit. They argued that some entrepreneurs' orientations are short-term in nature which prevented them from conceptualizing their businesses beyond the immediate future. Thus, they avoided long-term commitment with a consequent lack of demand for long-term financing.

In Kenya, businesses are supposed to be registered with the government (GOK 2005). This implies that registration legitimises the business operation and non-compliance is regarded as an offence. In as much as this is required, about 87% of the MSEs were not registered. Implying that they could not use their business as collateral (which is a basic requirement in credit markets) (Kimuyu and Omiti 2000). Similarly, businesses operating in Kenya are supposed to be licensed by their respective local authorities (which range from city councils to urban councils, depending on the business location) (GOK 2005). Notwithstanding that, only 60% were licensed which meant that just over half of the number of MSEs could request credit. Likewise, 74% of MSEs operated in temporary structures, - an indication of the generally short-term nature of their

businesses. This attribute lowered the lenders' willingness to deal with those enterprises as they also regarded the longevity of an enterprise as an indicator of their ability to service their debt.

On a regional basis, and in comparison to urban enterprises, MSEs in rural Kenya had a low demand and low access to credit opportunities. Nairobi and Mombasa had the highest concentration of enterprises that applied for credit at 8.80%, followed by other major towns at 8.50% with rural areas lagging behind at 5.30%. Other than the temporary nature of these businesses, the percentage may be explained by the small number of lending facilities in those locations, as it is generally expected that most formal lenders are mostly concentrated in urban areas.

As noted in the introduction section of this chapter, the scope of this study goes beyond determining the odds of the MSE demanding credit, but by also determining the factors which influenced the amount demanded by MSEs. Table 1, summarises the attributes of these factors, which are subsequently discussed.

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

Variables	Variable abbreviations	Description	Mean (Standard deviation)
Demand	Demand	Dummy variable; positive demand = 1, otherwise = 0	0.06 (0.24)
Loan applied	Amount_Appl	Average amount demanded per year in KES	41,031.50 (110,282)
Education	LogEduc	Number. of years the owner attended school	9.15 (3.54)
Revenue	Log Rev	Average revenue per month in KES	74,554 (1,840,219)
Income	Log-income	Average income per month in KES	9,288.20 (52,093.50)
Type of structure	*Structure*	Dummy variable; permanent = 1, otherwise = 0	0.26 (0.44)
Premises tenure	*Tenure*	Dummy variable; own = 1, rented, public and others = 0	0.18 (0.38)
Bank account	*Account*	Dummy variable; yes =1, no = 0	0.24 (0.43)
Records	*Records*	Dummy variable; keep records= 1, no = 0	0.36 (0.48)
Gender	*Owner-gender*	Dummy variable; female =1, male = 0	0.55 (0.50)
Registration	*Registration*	Dummy variable; business registered = 1	0.13 (0.33)
Strata	*Strata*	Dummy variable; urban = 1, rural = 0	0.77 (0.42)
Type of business	*Bus-type*	Type of business, partnership = 1	0.06 (0.24)
Membership	*Membership*	Whether the firm is a member of a group; yes =1; No.= 0	0.25 (0.43)
Employees	*Employees*	employees	0.14 (0.073)
Household size	*Hhsize*	Household size	3.85 (2.46)
Age of respondents	*AgeResp*	Age of the respondent in years	34.01 (11.29)
Business age	*Bus_age*	Year when the business started	1994 (7.77)
License	*Licence*	Dummy variable; Business is licensed; yes = 1, no = 0	0.40 (0.49)

Hypothetically, the size of the MSEs can determine the amount demanded (Baydas *et al*. 1994). It is assumed that the larger the firm size, the larger the amount demanded as credit (Baydas *et al*. 1994; Satyasai 2012). Regarding this aspect, the revenue that a firm generated can reflect the scale of its operation. Considering this variable, the monthly mean revenue of KES 75 000 indicates a reasonable size of the firm (by Kenyan standards) which by implication is supposed to increase the odds of demanding credit and amount demanded. However, the revenue standard deviation of KES 1 840 000 indicates a high dispersion, implying a prospect of having many low revenue earners (enterprises) - a fact collaborated by the low average number of employees (0.1). The corresponding small firms ended up borrowing low amounts (average KES 41 035.50). This finding is positively supported by a later study undertaken by Hash and Tosh (2010), who also found a significant relationship between firm size and credit application.

As stated in the theory of inter-temporal consumption (Section 3.2.1), a firm's decision-making was intertwined with the household's decision-making. This scenario implies that household's characteristics affected the type of decision the enterprise made. Thus, the size of the household

affected whether the firm demanded credit and the amount demanded (Swain 2002). Concerning this variable, a household mean size of 3.85 persons indicated a relatively large family size which by implication meant that the firm was more likely to demand credit. However, lenders may also ration credit provision if they viewed the size of the household to be large and as such perceived their ability to repay as low. This perception has been highlighted as the reason for MSEs low demand for credit and when they did request credit, they only requested a small amount. This scenario is because of the belief that MSEs would not have the finance available (because of large family sizes) to repay the loan (Swain 2002).

The survey also showed that the average age of business owners is 34 years old and a standard deviation of 11.3 years, therefore implies that businesses were run by relatively young people who because of their age, might have had difficulties in applying for credit. Likewise, it is expected that lenders will loan more credit to business owners who have a track-record with them. In this respect, the average year MSEs started operating was in 1994, meaning that many firms were younger than five years at the time of the survey. This indicated a relatively short period of engagement with lending institutions which may have been a contributor to credit rationing and subsequent low credit demand.

3.3.4 *Theoretical framework*

This study utilises a continuous consumer choice model to explain the historical behaviour of MSEs in demanding credit. The underlying theoretical model is an intertemporal utility maximization model with the following assumptions: First, the theoretical demand model took MSEs to be the unit of analysis whose sole objective was to maximise utility subject to budgetary constraints over a specific time horizon that was taken to be two periods (for simplicity purpose). Second, these entities exhibited a utility function (a standard assumption) that is well behaved, monotonic, and twice differentiable and strictly concave. Third, each enterprise had a given initial endowment of productive assets and socio-economic characteristics of the owners, and borrows only for productive purpose only. The model has been used before in a number of studies: - for instance, Iqbal (1983) and Swain (2001) used a similar framework to explain the demand for credit in India. Similarly, Okurut *et al*. (2004) and Mpuga (2004) used

the approach in analysing credit demand and rationing in Uganda. Therefore, it was thought that this analysis can adopt the same theoretical framework as the study analysis is similar to Iqbal (1983), Swain (2001), Okurut *et al*. (2004) and Mpuga (2004).

The continuous consumer choice model is presented as follows:

The firm maximises its utility:

$$U(C_1, Z^q) + U(C_2, Z^q)(1+r)$$ 3.1

Subject to the following constraints

$$f_1(K_1, Z^q) + B \ge C_1$$ 3.2

$$f_2(K_2, Z^q) + I_k K \ge C_2(1+r)$$ 3.3

$$K_2 = K_1 + I.$$ 3.4

The subscripts refers to the two periods, C indicated the level of consumption (C_1 and C_2 for period 1 and 2 respectively) and K_1 the initial capital employed by the business. Likewise, I represented investment, Z^q represented the firm's characteristics, which are exogenously given. P, P_k, r, and B represented prices of output, depreciation factor, interest rate, loan and total available time respectively. Price of output, interest rate and depreciation factors were also exogenously given.

The two periods assumed (period 1 and period 2) in this study were intended to capture the borrowing- investment- repayment cycle, where an enterprise borrowed in period 1, invested and repaid in period 2. It is assumed that an enterprise maximised total utility by maximising the level of satisfaction derived in the two periods (as indicated in expression 3.1). It is also assumed that in period 1, an enterprise maximised the level of utility by taking C_1 level of consumption (a product of business and household characteristics) subject to the firm's level of output (earnings). A condition captured in expression 3.2 and determined by the firm's initial capital and the borrowed credit, labour and other characteristics of the enterprises, and whose selling prices were exogenously given. Moreover, the model assumes no bequest for the subsequent periods. Similarly, as demonstrated in expression 3.4, in period 2, the firm maximises utility subject to period 2 earnings, less the level of depreciation (which is equal to the period 2 level consumption plus the amount repaid to the lender). Thus, an enterprise borrowed in the formative stages,

invested to earn higher income and repaid the borrowed fund at a later stage. This framework assists MSEs in showing the factors which influences their demand for credit.

The Model

The theoretical utility maximisation framework presented in the previous section provides the basis on which the Econometric Model is developed. The outcome of this model is to estimate the relative importance of variables in the MSE decision-making process. According to the framework, the decision concerning credit application and the amount applied for are endogenously determined. To suggest meaningful models to promote this relationship, it is essential to review some aspects of the most frequently used models concerning the context of this process. The models' adoption and applicability to this study are also discussed.

The study assumes that MSEs made two decisions with regard to their participation in the credit market. In order to observe a positive value of the credit demanded, two different hurdles were passed. First, the firm decided whether to apply for credit or not, and second, if the firm decided to demand credit, it must also have made a decision on the amount of credit required. Different variables are used to estimate each step of the decision process. The separation of the variables is critical for minimising the estimation errors arising from multicollinearity. The separation of variables is informed by the idea that if the variable in stage one is unrelated to the variable in stage two, the prospect of stage one affecting stage two results is reduced. Although there is no known basic rule to determine which variable is included in each stage, deliberate theoretical considerations are made in deciding which variables to include in each stage.

Estimating MSEs demand for credit using Univariate Probit Model and the rationale for variables used

In the first stage, an MSE decision is modelled as a dichotomous choice problem, in which focus is directed to modelling a relationship where the dependent variable is restricted and represents a selection from a set of jointly exclusive choices or categories (as, for example, demand for credit where responses are classified as "yes" or "no").

When the outcome is binary as in this case, regular regression via ordinary least squares (OLS) that is commonly used in economics cannot be used as it is inefficient (Aldrich and Nelson, 1984). Two reasons underlie this inefficiency: first, the assumption that the variance σ^2 of the error term is constant is violated when the dependent variable is dichotomous like in this case. The resulting heteroscedasticity therefore produces OLS estimates which are biased. Second, the dependent variable in this study is a dummy which takes the predicted values that lie between 0 and 1, making its estimation by OLS inefficient.

Consequently, as the assumption of linearity of association between dependent (demand for credit) and independent variables (determinant variables) is unrealistic, the non-linear probability model is recommended, of which the Logit and Probit Models have been used most often. This is because they are the most developed models in comparison to the other proposed non-linear alternatives (Aldrich and Nelson, 1984). These models constrain the predicted probabilities to between 0 and 1 and relax the limitation that the outcome of the predictor variables is steady across diverse predicted values of the dependent variable.

The Logit Model is used to predict the likelihood of occurrence of an event by fitting data to a logistic curve. Akin to various forms of regression investigations, it makes use of numerous predictor variables that may either be numerical or categorical to estimate the predicted variable. A substitute to the logit model is the probit model which is used to model categorical dependent variables, where the observed variable y is continuous but takes values between *0* and *1*. However, even though the outcome of the analysis for both models tends to be similar, the underlying distributions are different. While the Logit model assumes that the observed dependent variable follows a logistic distribution, the Probit model follows a standard normal distribution. Long (1997) for example, admits that the selection between the Logit and Probit models in an analysis is more of convenience than the production of efficient outcomes. However, he recommends the use of Logit models in cases involving multiple-equations regression systems involving qualitative dependent variables because the corresponding Probit model is too computationally demanding.

The first stage of the analysis estimates MSE credit demand using univariate probit regression by means of maximum likelihood analysis. The model takes the nature:

$$LD = \beta_1 X_1 + \varepsilon \qquad\qquad 3.5$$

LD is loan demanded, X_1 represents the vector of explanatory variables and ε is the random disturbance, which is assumed to be independent of X_1 and β_1 is the coefficient. The estimated model takes the following form:

$$Demand_{i1} = \eta_{i1} + \eta_{i2}\ LogEduc + \eta_{i3}\ strata + \eta_{i4}\ Registration + \eta_{i5}\ Bus\text{-}type + \eta_{i6}\ Accounts + \eta_{iI}$$
$$Records + \eta_{i8}\ Membership + \eta_{i9}\ Log\text{-}income + \eta_{i10}\ tenure + \eta_{i11}\ structure + \eta_{i12}\ Owner\text{-}gender + \mu_i$$

$$3.6$$

Where the *Demand*$_{i1}$ is the dependent variable measured in binary form where positive demand for credit assumes value 1 and 0 otherwise (where there is no positive demand for credit). Normally, financial institutions base their decision to lend to firms on their apparent uniqueness (Yan 1997; Kochar 1997). Some common indicators financial institutions use to evaluate such uniqueness include: the owner's level of education, location and structure of the business, business registration, land tenure, group membership and account holding.

A business owner's education often determines their ability to demand credit. This is shown in two ways. First, with a higher education, it is more likely that they are more able to complete an application form than business owners who have had little or no education. Second, as argued by the economic theory of intertemporal consumption (Section 3.2.1), education enables entrepreneurs to correctly value their future income and make the necessary critical decisions in respect of applying for credit. Therefore, because of the importance of education as an influencing factor in the demand for credit, it is factored into the equation as the number of years (*LogEduc*) the business owner received a formal education.

Another factor that is required for the equation, highlights the location of the enterprise. MSEs located in urban areas are expected, on average, to receive more business deals (Kochar 1997).

The urban dummy (*strata*) is therefore included to capture the influence location had towards a business' demand for credit. Similarly, enterprises that were registered were expected to have higher demand for credit than unregistered businesses. Since business registration is a government requirement (Kimuyu and Omiti 2000), non-compliance created an impression that the business is operating illegally. In addition, registration indicates that businesses owners have a longer term prospect of being in business and therefore would have the time to demand credit to use to grow the business. Moreover, lending institutes were likely to have looked at registered business owners as people who are determined to succeed because they had taken the time to register and licence their business. To capture this influence, the dummy *registration* is included in the model.

Consistent with the thought processes behind registration, the type of structure in which the business was housed profoundly influenced its sustainability. Businesses that operated in permanent structures were assumed to be more permanent than their counterparts in temporary structures which were prone to more risk and uncertainty (Okurut *et al*. (2004) . In addition, the structure in which the business was housed often indicated the firm's financial status, as creditors were not confident about lending money to a little "shack" businesses. The dummy *structure* is included in the analysis to capture the influence of structure.

Lenders would have liked to engage the services of credit reference companies to assist in indentifying the risk that a borrower may carry with them ref, however, these services was few and far between (Kimuyu and Omiti 2000). To protect themselves, lenders would demand collateral from borrowers to guarantee the credit given (Stiglitz and Weiss 1981). This implied that borrowers with no security found it uneconomical and unproductive to tender their application for consideration ref. Enterprises that operated in their own premises had a better chance of receiving credit because they could offer their premises or land as a guarantee against default of credit given. The *tenure* dummy is thus included to capture this influence.

During the time of this study, most MSEs in developing countries relied on the informal finance sector (a sector is said to possess more information about their clients than formal lenders) to meet their financial demands (Aryeetey 1998; Schoombee 1998). Apart from receiving credit

from moneylenders, many entrepreneurs habitually formed groups (Rotating Savings and Credit Associations) as a means of savings and a source of credit. The groups supported MSEs in two ways. First, members built a fund reserve in a group account by contributing on a regular basis to the joint kitty. This consolidated fund was used to advance soft loans to the group members. Second, micro-financing firms in developing countries used groups as a conduit for advancing loans. In this regard, being a member of a group increased the odds of accessing credit. Since borrowers evaluated the success probability before applying, higher success prospects translated into higher demand for credit. To capture this influence, the *membership* dummy is included.

Lenders, especially in the formal finance sector, also preferred to familiarise themselves with the borrowers' business before granting him or her credit. One method which they used to gain this knowledge was a request that potential borrowers open up an account with the respective financial institution. The time lag from opening the account to the time of granting credit was supposed to act as a screening device, where potentially risky borrowers were noted and denied loans. The lack of a bank account (*Accounts*) therefore reduced a borrower's chances of applying for credit since most banks tended to give preference to their clients.

Other variables that influences the demand for credit includes: *Bus-type (*type of the business)*, Records* (keeping of business records), *Log-income (*business income), and *Owner-gender* (the owner's gender). This is because the type of business is important to determine the influence various modes of business ownership have on credit worthiness. In addition, entrepreneurs who kept records were expected to have better prospects of demanding credit. However, women in developing countries such as Kenya are seen to be disadvantaged in the credit markets, because of the perception that they do not have the collateral to offer and have insufficient exposure to, and experience of, formal financial institutions (Armendáriz de Aghion and Morduch 2005). A dummy variable is therefore included to capture this influence. More references are required to substantiate all factual information

Consistent with Baydas *et al*. (1994), Manrique and Ojah (2004) and Okurut's *et al*. (2005) argument, the interest rate variable is excluded in the estimation model. The idea behind this decision takes consideration into the limited role the interest rate played in allocating credit in

asymmetric information credit markets of developing countries. For example, Besley (1995) showed that the net effect of the deficiencies in the credit market of developing countries produces outcomes where lenders hold interest rates constant and ration some borrowers depending on the perceived risk the client may portray. Consequently, the inclusion of this variable (which is constant) is of no estimation use.

Heckman Two-Stage Estimation Model for the Amount of Credit Demanded

This study extended the analysis of MSEs credit behaviour by also investigating the factors that determined the amount of credit demanded. In modelling the resulting relationship, the issue of sample selection bias is considered. Two reasons motivated this consideration: Firstly, the vital idea of a sample selection model is that the outcome (amount demanded), was only practical if some state, defined with respect to another outcome (positive demand for credit), was met. That is, enterprises which made the second decision concerning an amount to demand showed positive demand in the first place. This implies that the probability of determining the amount demanded by MSEs is a conditional probability which depends on those enterprises prior participation in the credit market. As the two stages are correlated, estimating the amount of credit demanded as a univariate probit might not provide the correct probability estimates; unless those two decisions were independent[6].

Secondly, even if the decisions concerning credit demand and the amount demanded were made simultaneously, sample selection bias can still arise. This is because the MSEs that made decisions concerning the amount demanded were a subset of a non-randomly selected sample. This factor is arrived at on the understanding that those MSEs which did not demand credit took this decision independently, and constitutes a self-selected rather than a random sample. Since it has been observed that a MSE's application for a loan corresponds with their specific characteristics; and given that these enterprises might have different preference structures, it means conducting a univariate regression becomes impractical as it might produce a biased outcome.

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[6] The intuition behind this argument is that if a substantial part of information is missing, running a regression with the amount demanded by these enterprises as a dependent variable may lead to a biased estimate of the dependent variable (amount demanded).

To overcome the consequential bias arising from the subsequent non-random sampling approach, this study employs the Heckman two-stage selection model which theoretically separates the selection model (determining business owners who applied for credit) from the equation of interest which estimates the amount of credit for which they applied. Amemiya (1985) referred to this as a Type 3 Tobit Model. Heckman's modulations provide a procedure of assessing sample choice partiality and a mechanism of correcting sample choice biasness in the analysis. He does this by formulating a method that allows conclusions to be drawn from the larger population and not just from the sample population under consideration. The method used (and is adapted for this study) was an estimation procedure for a continuous decision variable which incorporated the amount of credit that MSE owners demanded. The technique assumes that decisions to borrow and the amount to borrow were made concurrently.

Hypothetically, this model incorporates two equations:

Selection equation:

$$z^* \text{ (unobserved)} = \gamma'w + \upsilon \qquad \upsilon \sim N(0,1) \tag{3.7}$$

$$z = 1 \text{ if } z^* > 0 \tag{3.8}$$

$$z = 0 \text{ if } z^* \leq 0 \tag{3.9}$$

Regression or observation equation:

$$Y^* = \beta'x + e \quad e \sim N(0,\sigma^2) \tag{3.10}$$

$$Y_i = Y^*_i \text{ if } z_i = 1 \tag{3.11}$$

$$Y_i \text{ not observed if } z_i = 0 \tag{3.12}$$

Where z^* is the selection equation which also points to the likelihood of a MSE demanding credit and y^* is the equation of interest which measures the amount of credit demanded. Y is observed if and only if $z = 1$. The disparity of υ is normalised to 1 because only z, not z^*, is observed. Likewise, both error terms υ and e are assumed to be normally spread with correlation coefficient ρ and parameter γ and β vectors. As the two equations signify, the outcome variable Y_i, (amount demanded) is only observed if some criterion, defined with respect to a variable z (positive demand), is met. That is, a dichotomous variable z, determines whether or not Y_i is

observed (Y_i being observed simply if $z = 1$). Likewise, the second equation model is the predictable value of Y_i, restricted to observation.

As there is obviously a sample selection bias, the correction of this bias is done by computing a residual amount for each observation at each stage, which is then compared to determine the relationship of the residuals for the two stages and eventually an estimation of the equation of interest. Three steps are followed: First the selection equation is estimated independently by Probit Maximum Likelihood from the whole data set (This is simply the equation which explains the decision to demand or not to demand: $LD\beta X_1 + \varepsilon$). The next step involved the estimation of the expected error vector (inverse mills ratios - lambda) from the parameter estimated (Greene 2002). The third step pointed to the amount of credit demanded (γ) that is observed only when the selection equation equals 1 (i.e. when / if a MSE demanded credit), the dependent variable y is then regressed using ordinary least squares on the explanatory variables *x*, and the vector of inverse mills ratio from the selection equation. The aspect of regressing the second model, which incorporated an estimation of the expected error as an additional independent variable, removes the part of the error term related to the explanatory variables. In addition, the sample selection bias is also corrected by the inclusion of the selection equation when the characteristics of MSEs are determined. This observation points to its inclusion into the non-random sample (Swain 2002).

The estimated model takes the following form:

Amount_Appl = $\square_{i1}$ + $\square_{i2}$ Employees + $\square_{i3}$Hhsize + $\square_{i4}$ Bus_age + $\square_{i5}$ Log-Rev + $\square_{i6}$tarmack + $\square_{i7}$ Membership + $\square_{i8}$Licence + $\square_{i9}$LogEduc, twostep select (Struct tenure Log-Income Reconds Accounts Own-Gender Bus-type Registration strata LogEduc membership)

3.13

Where *Amout_Appl* is the amount of credit applied for by an entrepreneur which is expected to be determined by the number of employees (*Employees*) employed by the firm (a proxy for the size of the enterprise); household size (*Hhsize*) - families who depended on the business; age of the respondent (business owner) (*AgeResp*); business revenue (*Log_Rev*); and the proximity of

the business to good communication networks (*tarmack*). The *two-step select* (…...) regressors capture the selection variables as discussed in the previously.

Lenders expect that the size of the firm would have a positive correlation with the amount that the firm demanded as credit. As a firm expands, operation expenses and other costs increase, sometimes necessitating credit requirements. The number of employees employed by a firm is also used to indicate its size. Therefore, variable *Employees* is included to capture this influence. Similarly, a enterprise with had high revenue was expected to demand higher levels of credit, as it is assumed that they had capacity (stock, collateral, assets) to repay. The log of income (*Log_Rev*) is included to capture this aspect.

In an ideal situation, lenders offer and/or provide more credit to older more established borrowers with whom they shared a satisfactory track record. Therefore, it is expected that older more established businesses would demand more credit, having had a prior history of credit engagement/s. This expectation stems from the age (*Bus_age*) of the enterprises, when because of regular loan repayments; borrowers improve on their track record for demanding credit and as such pose as a less risky client. Similarly, the development level of a region was expected to influence the sizes of businesses which operated in those areas. The variable *tarmac* is included to capture the influence of the proximity of the business to major infrastructures like usable road networks. Furthermore, lending institutions are expected to be located near major infrastructures so that borrowers could access their services more easily than if they were situated in rural areas. Similarly household size is also expected to have an influence of the amount demanded (*Hhsize*). Other variables are as earlier defined.

3.4 Estimation Results and Discussion

This section presents the results on the analysis done on the probable causes of this state of affairs using Stata Data Analysis and Statistical Software. Mirroring the MSEs decision-making process in Section 3.3.4, the empirical investigation follows a two-step procedure. In the first stage, the factors which affected credit demanded by the MSEs are estimated, while the second stage gives analysis of factors which affected the amount demanded.

3.4.1 *Factors that determined the odds of firms demanding credit - the probit analysis results*

This section presents the outcome of the estimated Probit Model which determines the likelihood of the firms demanding credit. Even so, to make meaningful and correct inferences based on the reported analysis requires several critical factors to be considered: the number of data sets used in the analysis; the significance of the likelihood ratio; their R^2 (used to compute how close the data fits the regression line - it is also known as the coefficient of determination); their estimated coefficients and their standard errors (measures the precision with which a sample represent a population) as well as the significance that MSEs place on the various variables in determining demand for credit.

Referring to Appendix 3 (which is summarised in Table 2), the first item indicated is the Iteration Log. Generally, it is of little use in the interpretation of the results, but it contains information as to how well the model converged (the tendency for characteristics of populations to stabilize over time during estimation). The final log likelihood of -347.64, which converged at iteration level 3, indicated how easily the model converged to produce the estimates of various independent variables. The likelihood ratio of 66.26 with a $p-value$ of 0.000 gives the indication that the model, as a whole, is statistically significant at 1%, an indication that the model in its totality is appropriate for this analysis.

Table 2: *Univariate probit estimates of demand for credit*

Variable	Parameter Estimates	Standard Error	Marginal Effect
Constant	-3.124	0.626	
Level of the owner/s education	0.413***	0.243	0.045
Owner / s gender	0.015	0.111	0.002
Strata	0.179	0.145	0.018
Registration	-0.063	0.158	-0.007
Type of business	-0.165	0.210	-0.016
Account	0.548*	0.166	0.075
Records	0.081	0.117	0.009
Membership	0.349**	0.111	0.044
Income	0.014	0.044	0.002
Tenure	0.151	0.142	0.018
Structure	0.177	0.122	0.021
Log likelihood = -347.639			0.0537
Sample size = 1 541			

Note: * (** ***) indicate significance levels at 1% (5% 10%)

In regression analysis, it is also common to provide a measure of how well the model fits the data, such as R^2. Regrettably, though R^2 is used in linear regression analysis, no direct equivalent is available for limited dependency type of models, such as a Probit Model. Nonetheless, many statistical and econometric analyses utilise a broad range of pseudo - R^2 instead (Amemiya 1985). In this analysis, 0.0870 is indicated, but the figure cannot be used to measure the percentage of variance explained in the model, as R^2 does in OLS. The intuition underpinning this assertion is that it is impossible to observe the underlying latent variables in the choice discrete type of outcomes. This makes it impossible to compute what the proportion of variance the model explains (Hoetker 2007). Therefore, the reported pseudo - R^2 figure has no important meaning. Moreover, the parameters generated have no direct interpretation as the estimated coefficients are simply the values which maximise the model's likelihood function. For instance, if the MSE owner had an extra year of education, the probability of them applying credit increased by 41 percentile points (not per cent).

The outcome of the analysis also gives coefficient estimates of the predictor variables used to determine the likelihood that a MSE would demand credit. These estimates are supposed to be efficient point estimates and asymptotically unbiased (Amemiya 1985). In addition, the estimated standard errors, which give the common measure of the probable disparity in the estimated coefficients that one might expect to arise, are also given. As shown in Table 2, three independent variables were found to be significant determinants of demand for credit, albeit at different levels: - the dummies representing the operation of a bank account (*account*); membership of a savings and credit group and level of schooling of the owner of the business. The significant of the *account* variable is as expected since the process of opening a bank account enables the institution to acquire accurate and reliable data about the applicant.

Similarly, the *membership* variable is significant at 5% and the sign is as expected, thus implying that an enterprise whose owner was a member of a particular socio-economic group was more inclined to demand credit than their counterparts. This is consistent with findings by Huppi and Feder (1990), Ghatak and Guinnane (1999) and Armendáriz Aghion and Morduch (2005), whose line of argument is that accessing loans through groups reduces the transaction costs and information asymmetries. The outcome of low administration costs and reduced asymmetrical information allows lenders to pass the benefit to borrowers through favourable credit terms; hence providing more opportunities for enterprise owners to apply for credit.

Similarly to the expectation, the level of education is significant, albeit at 10%. This is expected, as the odds of receiving a loan by an educated entrepreneur are higher than for a less educated counterpart. The finding gives credence to Soman and Cheema's (2002) and Lusardi and Mitchell's (2011) argument that education empowers entrepreneurs with intellectual ability to resolve their inter-temporal optimisation problem. Similarly, low levels of education translate into borrowing avoidance as credit application procedures involve answering multiple questions / form-filling and discussions with financial institutions.

3.4.2 *Heckman two-stage estimation for the amount of credit demanded*
The second question of interest was to establish the significant factors which determined the amount of credit demanded by MSEs (as shown in Table 3).

Table 3: *Results of Heckman two-stage Estimation Model for the amount applied*

	Coefficient	Std. Error
Constant	11.314	8.960
Household size	0.210*	0.058
Revenue	0.303**	0.122
Membership	-0.498	0.384
License	0.473	0.359
Accessibility to urban centres	-0.020	0.265
Business age	-0.779	2.030
Number of employees	-1.614*	0.621
Level of education	0.976	0.785
Whether a MSE demanded credit		
Structure housing the business	0.177	0.166
Tenure	0.123	0.199
Income	0.098	0.065
Whether business kept records	-0.024	0.162
Access to formal banking	0.597*	0.159
Owner/s gender	-0.233	0.156
Type of business	-5.345	0.000
Whether business is registered	0.030	0.209
Strata	0.104	0.201
Owner/s education level	0.014	0.299
Group membership	0.296***	0.157
Constant	-3.045	0.825
Mills		
Lambda	-1.856*	0.570
Rho	-1.000	
Sigma	1.856	
Lambda	-1.856	

Note: * (**, ***) indicate significance at 1% (5%, 10%)

To make a correct inference from the Heckman analysis, it must be determined whether the two decisions made by the owner /s of a MSE (whether to demand credit and the amount demanded) were interdependent or not. The Heckman Selection Model, and the result it produced, indicated that the inverse mills lambda is significant at 1%. This shows that there is indeed a relationship between the variables which determined each of the two stages of the decision-making process - an outcome which justifies the decision to employ the Heckman two-step estimation procedure.

The variables, such as whether the enterprise had an existing relationship with the lenders (captured by operation of an account, "access to formal banking"), and whether the business owner belonged to a savings and credit group ("membership of a group"), are significant variables that need to be included in the selection model (i.e. whether a MSE would demand credit). This is partially consistent with the findings of the univariate analysis from the previous section – Section 3.4.1. Turning to the amount demanded, three independent variables were found to be significant: these included: the business owner/s' household size, the revenue the business earned and the number of employees they employed.

The number of employees, household size and revenue variables can all be construed to represent the size of the business. It is not surprising that the number of dependants in a household and the revenue of the enterprise are significant and with the expected positive sign. Generally, households, which have many family members, had a higher tendency to demand credit for both personal and business consumption than households with fewer family members. In addition, the model's indication that the amount of revenue that MSEs generated reflected their size and, by extension, their ability to repay credit is consistent with Hash and Tosh's (2010) findings. The age of the business also produced the expected result. The negative result indicated that younger MSEs demanded less credit than older MSEs.

However, a variable which produced an unexpected result is the 'number of employee variable' (*Employees*). It is expected that bigger MSEs are more likely to hire more employees than smaller MSEs. This is at odds with the estimation result, which indicates that firm size according to employee numbers is negatively associated with the amount of credit demanded. This unexpected outcome can be explained by the peculiarity of developing countries' economic markets where small businesses are

often managed by family members, who often have no alternative employment (CBS *et al*. 1999). Implying a bigger employment portfolio does not necessarily mean a bigger firm.

3.5 Conclusion

The overall objective of this study was to evaluate whether the change in lending policy undertaken in 1996-2006 - from individual lending to group lending had any theoretical and empirical justification. For this to be evaluated, the factors which restricted MSEs from accessing credit must be known.

From a theoretical analysis, two hypothetical frameworks underpinned the demand for credit, - credit rationing and intertemporal allocation of income. Credit rationing theory indicates a borrower's perception that if they perceived they would be successful in their demand for credit that would determine the odds of them applying for credit. This suggested that demand was a function of the credit supplied - implying lack of supply created a lack of demand. Therefore, the theory hypothesizes that the factors that promoted an enterprise's credit worthiness generated a greater demand for credit. Similarly, the inter-termporal allocation of income speculates that MSEs inter-temporal allocation of income was not easy, the implication was that enterprises did not demand credit against future income.

On the empirical front, demand for credit was greatly affected by whether the enterprise's owner: had a previous association with the lender, was a member of a credit group and their highest level of schooling. The results of these three factors pointed to the necessity for micro-entrepreneurs to improve their literacy and analytical aspect of understanding their business. It also indicated a positive correlation between an owner's age, their application for credit and the size of their firm's revenue. The challenge, therefore, is to evaluate whether group lending (analysed in Chapter Five) had capacity to mitigate these challenges to enable informed judgment on whether the change of policy was appropriate.

CHAPTER FOUR

HISTORICAL INCIDENCES OF CREDIT RATIONING IN KENYA

4.1 Introduction

This chapter continues from Chapter Three as they both offer a contextual and empirical basis from which the appropriateness of the shift in lending policy can be evaluated. As discussed in Chapter Two, apart from problems associated with lack of demand for credit (the basis of analysis in Chapter Three), MSEs were credit rationed. This chapter examines the factors or reasons why MSEs were credit rationed when they demanded credit.

Two main reasons were given to explain this state of affairs: First, finance was mostly offered to support successful businesses while credit to MSEs was rationed (Kimuyu and Omiti 2000; Okurut *et al*. 2004**).** Second, if MSEs did get access to credit, they were subjected to unfavourable credit conditionality, which ended up reducing their ability to access the credit required (Okurut *et al*. 2004). The net effect of the two reasons created outcomes where the credit needs of the MSEs were not met. As indicated in the Chapter Two, the change in lending policies by the government initiated programmes was partially intended to address this problem. To evaluate whether the change in the lending policy was necessary, a proper understanding of critical factors which make these enterprises to be credit rationed had to be investigated so that they could be put into proper perspective. It is on this basis that this chapter should be understood.

The remaining part of this study is structured as follows: Section 4.2 reviews the theoretical underpinnings of credit rationing and empirical investigations into credit rationing in developing countries, whereas Section 4.3 describes and discusses the data and the theoretical and modelling framework used, while Section 4.4 discusses the research findings. Section 4.5 concludes this section.

4.2 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 arouse. 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. 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).

4.2.1 *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). In this idealised free credit market, loans are traded competitively and the interest rate is determined by the market (Besley 1994). The price of credit – the interest rate - therefore, must be high enough to motivate lenders to provide credit to people seeking to invest in financing their business; and must be low enough to encourage borrowers to pay back the borrowed credit - given their consumption and investment needs (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: 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[7] 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

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[7]   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).

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 maximise 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 equalled the demand for credit (Wolfson 1996). One lesson that emerged from this is that at 'equilibrium' a credit market probably was characterised by credit rationing (Stiglitz and Weiss 1981; Wolfson 1996). The following section reviews the historical analysis of financial market equilibrium in the presence of asymmetric information. More specifically, the problems posed by adverse selection and moral hazard that resulted in credit rationing in the financial sector.

Adverse selection and the interest rate

In perfect markets, equilibrium entails quantity of credit demanded equalling the quantity of credit supplied. Thus, if quantity demanded exceeds quantity supplied, the 'price' (interest rate) increases and this leads to a decrease in the quantity of credit demanded. Likewise, if quantity supplied of credit exceeds quantity demanded, the 'price' decreases leading to an increase in quantity demanded until quantity demanded and supplied are at equilibrium. Under equilibrium, there is no credit rationing. The interest rate therefore acts as an equilibrating factor. Nonetheless, this can only happen in a perfect information environment where lenders have all the relevant information to guide their decisions. This section, therefore, discusses the effect of interest rate on adverse selection. (Besley 1994).

In his pioneering work in this area, Akerlof (1970) succinctly expresses the dilemma facing buyers in asymmetric information markets. His theory rests on the fact that sellers know the quality of the product they sell (the information not necessarily available to the buyers). This means that the buyers cannot *ex ante* differentiate the quality of the product in the market. For this reason, they offer an average price which is less than the reservation price of high quality goods, an outcome leading the sellers of high quality goods to withdraw their goods from the market. Hence, the market for high quality goods may fail (Akerlof 1970). In the same way, if

the lender posted a high interest rate that reflected the average risk of the borrowers in the market, it could have drawn a disproportionately large share of loan applications from less creditworthy borrowers while causing low risk borrowers to drop out of the pool of potential borrowers, - an outcome which could have affected the expected repayment to the lender (Stiglitz and Weiss 1981) and this may be a repeat. Knowing the possibility that this might happen, lenders were reluctant to increase the interest rate (Stiglitz and Weiss 1981). As Akerlof (1970:500) noted, "the difficulty of distinguishing good quality from bad is inherent in the business world: this may indeed explain many economic institutions and may in fact be one of the more important aspects of uncertainty".

Stiglitz and Weiss (1981) in their seminal paper pose the question "why is credit rationed?" Since then, their thesis has generated quite a wide discussion on the role of information asymmetries in credit markets (Carter 1988; Parker 2001; De Meza and Webb 1987; Williamson 1987). Their paper has subsequently influenced a wide range of theoretical developments on credit rationing - identifying adverse selection and moral hazard as the main culprits. Stiglitz and Weiss's arguments generally rested on four broad assumptions. First, lenders cannot differentiate the risk type of borrowers *ex ante* before they access credit and, secondly, the loan contract is subject to limited liability. This limited liability translates into lenders bearing all the costs in case of default. Thirdly, their analysis is also restricted to involuntary default – they assume that borrowers repay the credit when they have means to pay. Lastly, they also assume risk-neutral borrowers who only undertake one project each with two possible outcomes: - success or failure.

Stiglitz and Weiss (1981 demonstrate that, though a lender can utilise the interest rate that a borrower is willing to pay, a higher interest rate may on average, decrease the expected credit repayment by increasing the risk of the financed projects. This adverse selection occurs because borrowers who are willing to borrow at a higher interest rate are more likely to take on high-risk projects whose ventures are likely to pay off. However, a higher interest rate leads 'safe' borrowers with low expected project returns, albeit with high probabilities of success, to exit the market, since the possible payoff of their projects is too small to pay the higher interest rate. So, it would be better for the lender to charge a higher interest rate to the 'risky' borrowers and low

interest rate to 'safe' borrowers. However, because lenders lack perfect knowledge, they set common rates for both categories of borrowers, which give zero economic profits.

Subsequently, a number of authors have investigated the above issue within the structure of imperfect information frameworks (Carter 1988; Parker 2001; De Meza and Webb 1987; Williamson 1987). Although their findings are diverse, they mostly agreed on the basic foundations and arguments hypothesised in the Stiglitz and Weiss (1981) model. Among the authors who support Stiglitz and Weiss (1981) model is Carter (1988) and Parker (2001). Other authors' findings such as De Meza and Webb (1987) and Williamson (1987) are either contrary to or claim less than what is postulated by the Stiglitz and Weiss (1981) model.

In agreement with the Stiglitz and Weiss (1981) model, Carter (1988), also highlight that a lender operating in an unrestricted, laissez-faire market and facing an undifferentiated pool of borrowers is better off arbitrarily discriminating against some borrowers than increasing the interest rate to clear the market. The reason for this assertion is that, after a particular critical interest rate is reached, the average characteristics of a borrowing group tends to worsen which, in turn, leads to low lending profitability. Since lenders are aware of this effect, unrestricted market equilibrium can "exhibit self-imposed interest rate restrictions" Carter (1988:92) whereby they ration credit to some borrowers Carter (1988). This accords with the Stiglitz and Weiss (1981) thesis since lenders' expected returns are higher if they arbitrarily ration credit to applicants than if they raise the interest rate to eliminate the excess demand in the market.

Parker (2001) introduces another dimension of the analysis of adverse selection resulting from a rising interest rate. He argues that increasing the interest rate beyond some critical level can lead productive low risk individuals to seek paid employment rather than engage in business, hence leaving low productivity but high-risk individuals to undertake business ventures. Parker's (2001) findings reaffirm the Stiglitz and Weiss (1981) findings that, either way, increasing interest rates reduces the composition of borrowers who demand credit, which in turn, compromises the lenders' profitability.

Although appealing, a shortcoming of the adverse selection theory arises from lenders' decisions to charge interest rates separately from other considerations such as the amount demanded. As Bester (1985) noted, lenders concurrently make decisions about the rate of interest rate to charge as well as the type and amount of collateral to request. Bester (1985) showed that lenders are capable of indirectly differentiating between borrowers' risk levels by giving pairs of incentives compatible with different collateral contracts, such as interest rate combinations. This implied that, where contractual enforcement systems are working, non-price credit rationing might not arise as lenders can set various interest rates corresponding to the risk category of particular borrowers. Likewise, De Mezza and Webb (1987) states that, even where lenders are able to rank the financed projects on the basis of their success possibilities, asymmetric information may lead to under-estimation or over-estimation of risk which may lead to the possibility of over or under allocation of credit in the market.

From this discussion, although differing in specifics, it can be deduced that in an asymmetric information environment, the credit markets do not clear. This section is therefore critical to the overall goal of this thesis as it implies that any change in policies was supposed to have targeted aspects which reduce adverse selection in the credit market.

Moral hazard, interest rate and the role of collateral in mitigating against credit rationing

Apart from the problem associated with adverse selection, there was the problem associated with the lender's inability to effectively monitor the borrower's activities and effort towards the success of their projects (Ghosh *et al*. 2001). This resulted in moral hazard and associated contractual problems (Armendáriz de Aghion and Morduch 2005). Given that the borrower pays the lender when the distribution of returns is favourable, the level of effort which borrowers invest in making their businesses successful is of great importance to the lender. The inability to observe the actions of the borrower can increase default risk by reducing the borrower's effort in avoiding low project returns (Ghosh *et al*. 2001). This section reviews the literature on the effect of interest rate on moral hazard. It also discusses the limited usefulness of collateral in mitigating the problem in developing countries.

Given the difficulties in enforcing contractual obligations in developing countries, a borrower was expected to have little motivation to make their business succeed as most of the return arising from their profits benefitted the lender (Ghosh *et a,* 2001). This was because borrowers enjoyed limited liability arising from inadequate provision of collateral to guarantee full credit, and due to a weak and inefficient legal system, In this regard, a higher debt burden caused by a higher interest rate reduced the borrower's motivation to give of his best effort (Ghosh *et a,* 2001). Just as in the problem of adverse selection, the interest rate therefore, could not have been used effectively as a market-clearing instrument since it affected the strategies and conduct of the borrowers (Ghosh *et a,* 2001).

The failure of the interest rate to mitigate moral hazard has been analysed in the historical literature (Ghosh *et al*. 2001). The literature records the general agreement on the counterproductive nature of increasing the interest rate to correspond with the riskiness of a borrower's business. In one such recording, Ghosh *et al*. (2001) for example, argues for the existence of a trade-off between the "extraction" of rents and the provision of incentives to induce good project returns. This implies that lenders are generally stuck between two positions: on one hand, they may increase the interest rate and reduce the borrower's incentive to exert effort towards the success of their projects; or on the other hand, they may reduce the interest rate, possibly to a level where it does not sufficiently cover the risk involved, and hence motivate borrowers to invest more effort in their projects.

In the same way, as the interest rate changes, the behaviour of borrowers may also change. Borrowers, by design, may receive credit and use the borrowed money in other activities rather than the agreed purpose, and in the process compromise the ability to repay the lender (Williamson 1987). High interest rates therefore, might induce another type of moral hazard where borrowers intending to take low-risk projects shift to high-risk projects that promise higher returns but with high probability of failure (Williamson 1987).

Williamson (1987) argued that even in a credit market where lenders and borrowers possess perfect information, but with costly monitoring, equilibrium credit rationing, as described by Ghosh *et al*. (2001) can still hold. He argues that even where an optimal credit contract is jointly agreed by the two parties, the expected cost of monitoring the borrower's repayments increases

with the loan interest rate (Williamnson 1987). This, he explains, arises from the fact that borrowers who expected to pay a high interest rate are more prone to investing their funds in high yielding albeit low success projects, an assertion akin to the Stiglitz and Weiss (1981) model.

In the presence of information asymmetries, lenders may require collateral to cushion them against non-repayment risk (Stiglitz and Weiss 1981); Ghosh *et al*. 2001). Stiglitz and Weiss (1981) and Ghosh *et al*. (2001) extend their debate by discussing the role of collateral in justifying the problem of moral hazard. Their common position is that a collateral constrained borrower has more chance of defaulting on a loan than a borrower who has enough collateral to guarantee the full cost of the credit contract. However, they also assert that inefficient legal methods of contract enforcement reduce the importance of collateral in the credit market.

Similarly, Stiglitz and Weiss (1981), for example, argue that if lenders increase their debt-equity ratio requirement, it encourages borrowers to demand small loans that are only capable of starting small projects. Since many MSEs in developing countries are generally collateral constrained, it means they will only qualify to access a limited amount of credit which is only capable of financing small operations. The small size of an enterprise, in itself, increases the probability of defaults since small enterprises are generally disadvantaged in competitive markets due to lack of economies of scale in production.

Moreover, as Stiglitz and Weiss (1981) show, increasing collateral requirements beyond a particular critical point may decrease the expected returns by decreasing the average degree of risk aversion within the pool of borrowers. They assert that borrowers who can afford to offer higher collateral may be business owners who, in the past, may have succeeded at risky endeavours. In that case, they are likely to be risk-averse borrowers who have in the past invested in relatively safe but low rewarding endeavours are consequently unable to raise large amounts of collateral. One would therefore expect an increase in the collateral requirement to

attract wealthier borrowers albeit with the greatest risk, consequently increasing the probability of default among the pool of credit borrowers.[8]

4.2.2 *General applicability of the theory in explaining credit rationing among MSEs in Kenya in 1999- 2006 period.*

From the previous discussion (Section 4.2.1), a number of authors have investigated the issue of credit rationing within the structure of imperfect information frameworks (Stiglitz and Weiss 1981; Carter 1988; Ghosh *et al*. 2001; Parker 2001). Their findings are diverse. However, even though they differ in specific assumptions made in their respective models, 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.

One common hypothesis suggested by the models reviewed (Stiglitz and Weiss 1981; Parker's 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 during the 1996 – 2006 decade; first, the credit referencing facilities where lenders could have made reference to borrowers' previous engagements was and still is 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.

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[8]   Full collateral guarantees cannot entirely solve the lender's problems. In the context of other problems associated with credit enforcement in developing countries, it may not be an easy task for a lender to sell/liquidate the collateral offered due to inefficiencies in the legal systems and family ownership of properties.

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). Beck (2000: 1), for example, asserts that the "inconsistent application of law - due to limited role of binding precedent, high degree of discretionary power of judges and the possibilities of several levels of appeal", undermines efficient contract enforcement in developing countries and negatively affects the resolution of credit disputes in courts. The cost of inefficient legal systems, in discouraging financial intermediation, was also earlier mentioned by Yan (1997), who argued 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 Ibrahimo 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 in Section 4.2.1 - 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 Ibrahimo 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.

The above discussion showed that lenders and borrowers were subject to uncertainty concerning their expected project returns. This uncertainty meant that each party could have had different expectations on the outcome of loaning/receiving monies. Considering the limited liability aspect of credit markets, lenders were expected to be more risk-averse than borrowers. In this regard, credit rationing can be viewed as a consequence of the differences of perceptions toward risk.

4.2.3 *Determinants of credit rationing - empirical review*

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 overcoming this problem to give possible methods of computing the extent of credit rationing in a market. 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. Kochar's approach is of particular interest - this is because the model allows for an estimation of a set of structural equations which separates the demand decisions with effective 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. These survey mechanisms can be designed to make out both the supply and demand condition of the credit market, which would make it possible to measure the credit rationing for each borrower. For example, if a borrower applied for credit and the application was rejected by the formal or informal sector, it could have been taken as evidence of positive demand and zero supply and hence the aspirant borrower was credit rationed. An example of this line of argument includes Baydas *et al*. (1994) and Zeller's (1994) studies in which they employed a binary estimation model to estimate the probability of credit rationing.

Kochar's method was of particular interest because she was able to separate the demand decisions with effective credit rationing. First, Kochar utilised a univariate probit model to estimate the household demand for credit, a bivariate probit model to estimate demand and access to formal credit, and trivariate probit model of demand to estimate the choice between a firm's demand for credit and access from formal or informal sources (Kochar 1997),.

By estimating the first two structural equations on data derived from a sample of 3 672 households drawn from a 1981-1982 Government of India Household Survey on credit transactions, indebtedness and household and farm investments, Kochar found that the probability of a household demanding credit was 38.93%. Considering that Kochar's analysis was based on the assumption of MSEs having a positive demand for credit implies that about 61.07% of the households might have been credit rationed. To measure whether the business owners who applied were credit rationed, Kochar estimated the conditional probability of access (evaluated at the mean value of variables). Given a household demand for credit - which she found to be 60.42%, it implied that the majority of those households that demanded credit were offered the amount requested. However, it also showed that 39.58% were rationed. The high success ratio can be explained by the fact that demand was a product of an associative process where borrowers progressively self-selected themselves over a period of time. Those who perceived that they had a high chance of securing credit, based on their previous experiences, were the borrowers who were more likely to have applied for credit (Kochar 1997),.

Kochar found the demand for loans made by households was significantly influenced by the amount of land owned by the household, the amount of irrigated land at the start of the reference year, and the number of plots under cultivation. Other factors which affected demand were regional variations in agricultural productivity, captured by a set of dummy variables. In contrast, households which were found to have no credit were owners with zero demand for credit or who had no access to the formal sector and found informal sector credit too costly to use.

Additionally, the bivariate estimates suggest that access (and rationing) to formal loan finance was primarily determined by regional measures such as roads measured in the length of concrete road per 100 km^2 and food yield (productivity) calculated at 100 kg per hectare. Even though household's ownership of land and irrigated land was found to influence demand, their effect on

access (i.e. supply of credit) was found to be positive but insignificant. This illustrates that the set of variables used by the formal finance sector in making supply decisions differed considerably from the factors influencing a household's credit demand (Kochar 1997).

Kochar (1997) also used a trivariate probit model to estimate the complete theoretical model where households were free to choose between the informal and formal financial sectors. The study found that households chose to apply for either informal or formal credit depending on individual regional characteristics and their credit needs. Thus, a household might seek credit in the informal sector, either because they were credit rationed by the formal sector or they preferred the informal sector because of its relatively lower application requirements.

One crucial aspect of the model used by Kochar, known as the Partial Absorbability Model, is that the researcher can estimate the extent of credit rationing without directly observing the demand and supply characteristics. This is important because many data sets do not separately capture the households who are price rationed and non-price rationed.

Adopting Kochar's model, Swain (2002) conducted an empirical investigation into the extent of effective credit rationing by the formal and informal finance sectors in the rural credit markets of Puri, also in India. The survey had information on 1 052 households selected through two-stage stratified sampling from 66 villages spread over eleven administrative blocks. Similarly to Kochar's (1997) study, Swain employed three different models: In the first model, she found access to credit, measured in binary form to be fairly low at 29%, implying that 71% of households were credit rationed. However, her bivariate probit model estimation, measured by the joint probability of households' demand and lenders' decisions, revealed an improved probability of accessing credit of 40% implying that nearly 60% of the households were credit rationed. The difference in findings between the two models is explained by the effects of the positive household demand assumption made in model one; considering that not all households had a positive demand for credit which implied that they were not as constrained as portrayed in the univariate model.

In particular, her study found food (grain) yield per hectare and the level of infrastructural development of the region determined the likelihood of access (and credit rationing) to credit by

households – this is as expected as potential lenders can more easily access households in more developed regions than those in the less developed parts of the country. Moreover, as expected, the amount of planned bank credit dispensed for all purposes per cultivator, quality and type of land, the size of the family, environmental and weather conditions (proxied by monsoon rain) were found to be positive and significant factors associated with access to credit. This is anticipated since these tend to contribute positively to a greater agricultural production.

A substitute technique to the method used by Kochar (1997) and Swain (2002) is to develop study tools that allow for the division of various samples depending on their actual loan demand. A number of historical studies conducted in developing countries have adopted this approach (Baydas *et al*. 1994; Zeller 1994). Baydas *et al*. (1994), for example, estimated the demand and supply models to analyse the factors lenders used to ration credit in special micro enterprise programmes among 447 entrepreneurs in Ecuador.

To avoid biased results in capturing the extent of credit rationing, Baydas *et al*. (1994) made use of a simultaneous equation system utilising information on both borrowers and non-borrowers. According to them, credit market interactions produced three possible outcomes: the first being, borrowers had positive demand and got zero credit; in the second outcome, borrowers received a smaller amount than applied for; and in the third outcome, applicants were granted their full request. The first and second outcomes represented a credit-rationed entrepreneur.[9] Their findings, generated from maximum likelihood estimation of the simultaneous equations, demonstrated that the interest rate is positive and significant at the 1% level. This indicated that lenders were ready to provide more substantial loans at higher interest rates. In addition, the study found that lenders were more inclined to make longer maturity loans to micro entrepreneurs, which implied an attempt by lenders to lower transaction costs. Furthermore, a high probability of credit supply was associated with more profitable enterprises and entrepreneurs with higher levels of education. An important aspect of their analysis was that they separated loan demand from the loan supply effects of the model, since they considered a single supply or demand equation would lead to misinterpretation of results. However, the main

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[9]   Loan rationing is captured in the model by inserting dummy variable = 1, if the loan supplied is equal to or more than the loan demanded by the borrowers and zero otherwise.

shortcoming of Baydas *et al*. (1994) study was the exclusion of all the partially rationed borrowers, by assuming that their loan applications were rejected.

Similarly, Zeller (1994) captured the extent of credit rationing by developing research instruments which separated various credit outcomes among 189 randomly selected households in three environmentally diverse regions of Madagascar. In Zeller's analysis, participating in borrowing was given as a function of the household's or individual's decision to demand credit and the supplier's decision with respect to granting credit access, implying a two phase decision-making process and three distinct outcomes. First was the category of borrowers who, out of self selection, did not demand credit due to their perceived low success probability. The second category consisted of borrowers who applied for credit but received less than requested and the third group represented borrowers who received the full credit they demanded. The first two categories constituted credit rationed households. To settle on each outcome, direct questions concerning the amount requested and received was directed to every household, whilst direct questions targeting reasons for not applying were asked to capture individual's answers who never applied for credit due to self exclusion (i.e. self selection in terms of not applying for credit).

Using a univariate probit model for each of the two rationed outcomes, Zeller found that lenders rationed loan demands based on the total household wealth. Furthermore, credit rationing was found to be closely tied to borrowers' characteristics such as income, wealth, ability to post collateral and the ability to repay. Moreover, the number of dependants in a household was also found to be significantly associated with the incidence of credit rationing. Likewise, the probability of being credit constrained by informal sector lenders was found to increase significantly with the age of applicants but decrease with the number of years of schooling because lenders believed that the number of years of schooling was a strong indicator of credit-worthiness.

Similar to the environment where this study was conducted, Okurut *et al*. (2004) utilised a logistic model to estimate the extent of credit rationing among 10 692 households drawn from a Uganda National Household Survey of 1999/2000. The model determined whether people ever applied for credit at the national level, or within each of the four regions. The dependent variable

in stage one was the individual household demand for credit and credit rationing all measured in binary form. In the second stage, the dependent variable also took a continuous form to capture the amount of credit given to the household.

They used a combination of numerical and non-metric measurements (such as: binary and categorical) to estimate the explanatory variables. Dummy variables relating to gender and migration status of the household were used, while respective scale variables were used to capture the influences of a borrower's age, education (number of years spent in school), household expenditure, dependency ratio and value of assets.

Their findings illustrated that credit supplied by lenders was determined to a large extent by the area in which the borrower's resided, even though observed social-economic variables like household assets, expenditure, and amount of land owned and education level played a part. Credit rationing was not clearly observed, since most of the borrowers received the amount of credit for which they applied. This finding may be attributable to the likelihood of self exclusion (self selection process by borrowers) where borrowers who perceived their probability of successfully securing credit to be low and therefore did not apply for credit.

Dutta and Magableh (2006) analysed the socio-economic characteristics of the borrowing process. They, in particular, investigated the factors which affected borrowing behaviour. By employing a probit model to estimate the determinants of loan application and a Heckitt Model to determine the supply of credit (based on a sample of 474 micro-entrepreneurs in 2003 survey in Jordan) they found that, repayment capacity of enterprises was the main determinant of credit rationing in the micro-finance sector. Religious beliefs, availability of collateral and social responsibility were in particular, found to influence rationing.

A different strand of literature, which nevertheless complements the already discussed propositions, is a study by Craigwell and Jefferey (2010) in Barbados. By employing a Markov-Switching Model and using a longitudinal data compartmentalized into three time-periods, Craigwell and Jefferey concluded that lending institutions are more cautious in times of uncertainty, particularly during recessionary periods. Their finding gives credence to the suggestion that lending institutions not only evaluated the likelihood of borrowers repaying

credit but that they also considered the prospect of other intervening factors influencing repayment. This implied a possibility of different credit outcomes confronting the same borrower in different periods of time.

Similarly, Shikimi's (2013) study of small and medium scale Japanese enterprises between the period from 2000 to 2002, found that firms with more collateral obtained more credit than firms without a sizable collateral. Shikimi's findings corroborated the results of an earlier study by Carbo-Valverde *et al.* (2009) who, by utilising data based on 30 897 SMEs in Spain over the period from 1994 to 2002, observed that an increase of 1% in their tangible assets increased the likelihood of firms accessing credit by 0.45%.

Summary of the empirical literature

The literature review indicates that credit rationing can be fairly well modelled using socio-economic characteristics of households. Two methods of measurement have been suggested: One approach is to design the study instrument so that it allows the separation of various samples depending on their effective credit demand. The resultant data can then be estimated using univariate and bivariate models. The alternative method identified as the partial absorbability model, postulated that the extent of credit rationing can be estimated without directly observing the demand and supply characteristics of a household. This is important for data sets which do not capture separately the demand and supply decisions and outcomes of the households.

The other aspect arising from the review is that various social-economic factors that impeded MSEs from being given the full credit they required. The review confirmed the general belief that a considerable number of micro enterprises and poor households were credit rationed by both the formal and informal financial sectors. Since the interest rate cannot be used as an instrument to allocate credit, lenders used other mechanisms to determine the credit-worthiness of borrowers. The review provides evidence that, apart from collateral requirements, lenders gauged the riskiness of the requested loan based on the borrower's socio-economic attributes borrower. Thus, lenders based their decision on whether to give partial, full or zero credit in accordance with these attributes.

4.3 Data Source, Description and Theoretical framework

This section discusses the source of information used in this study (discussed in Chapter Four). It also describes the data and the theoretical framework employed.

4.3.1 *The source of data*

Just like in Chapter Three, the data used in this Chapter is also drawn from the 1999 National Micro and Small Enterprise Baseline Survey. The subsequent suitability of the data was discussed in Section 3.3.1.

4.3.2 *Historical explanation 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 demanded 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".

The general consensus, according to the literature, is that MSEs were credit constrained and rationed (Kochar 1997; Swain 2001). Given this general belief, it is imperative to look at the Kenyan experience from a historical perspective. The remaining part of this section provides a preliminary description of the sample used.

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. Table 4 indicates low levels of credit demanded and accessed credit access after application

Table 4: *Demand for, and access to, credit in Kenya*

Region	Credit application (%)	Credit access after application (%)
Nairobi and Mombasa	8.8	74.6
Other major towns	8.5	63.0
Urban centres	6.9	85.7
Rural	5.3	62.5

Source: *CBS et al.* (1999)

Considering that about 90% (refer to Chapter Two) 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 5 (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.

Table 5: *Description of Variables used in Estimating Credit Rationing*

Variables	Description	Mean (Std deviation)	percentage
Demand	Dummy variable; positive demand = 1, otherwise = 0	0.06 (0.24)	6.4
Loan applied	Average amount demanded per year	41,031.50 (110,282)	-
Education	No. 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)	26
Premises tenure	Dummy; own = 1, rented, public and others = 0	0.18 (0.38)	18
Bank account	Dummy; yes = 1, no = 0	0.24 (0.43)	24
Records	Dummy; keep records = 1, no = 0	0.36 (0.48)	36
Gender	Dummy; female = 1, male = 0	0.55 (0.50)	55
Registration	Dummy variable; business registered = 1, no = 0	0.13 (0.33)	13
Type of business	Type of business; partnership = 1, others = 0	0.06 (0.24)	6
Membership	Whether the firm was a member of a group; yes = 1, no = 0.	0.25 (0.43)	25
Employees	No. of employees	0.14 (.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)	40

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 affected the prospects of their enterprises in securing credit. Armendáriz de Aghion. and Morduch (2005: 13), for example, reported that "Grameen has found that not only does having a customer base that is 95 per cent 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.

As discussed earlier in terms of the demand for credit (Section 3.4.1), 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 National MSE Baseline Survey (in 1999), the majority of the enterprises were less than five 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).

4.3.3 *Theoretical framework*

The theoretical and empirical framework used in this study closely follows the conceptual framework developed by Kochar (1997) and later adopted by Swain (2002). Their approach is adapted from the credit rationing models initiated by Stiglitz and Weiss in 1981. This section reviews the theoretical and empirical framework underlying the analysis of this phenomenon. The remaining part discusses the assumptions used in constructing the theoretical framework and the econometric framework employed. In addition, the conceptual explanation of the model's variables and their measurements are discussed.

Theoretical Framework Assumptions

The theoretical framework adopted is built on the following assumptions:

Assumptions regarding the formal finance sector

Since the formal finance sector's objective was to maximise profit subject to various constraints, the overall supply curve $B(x, r)$ was expected to be an increasing function of the interest rate (r) and the borrower's characteristics (x). Consequently, the cost of borrowing was supposed to be a result of each MSE's expected probability of default (Kochar 1997). Nevertheless, this supply schedule was "hypothetical" for it was neither practised nor offered to the borrowers because of the asymmetric information in the market (Swain 2002). Therefore, formal lenders were constrained to lend at a fixed interest rate to MSEs in a particular category regardless of the amount given. As a result, the effective formal finance sector supply schedule for MSEs was horizontal at the fixed interest rate (r^*) (Swain 2002).

Assumptions regarding the informal finance sector

Informal finance lenders possessed superior information about their customers than formal lenders. They also had better credit enforcement mechanisms like social penalties when a person defaulted than their formal sector counterparts, an advantage derived from their closeness to their clients and the communal based nature of their work (Kimuyu and Omiti 2000). By using this information advantage, the informal sector lenders were able to define the borrower's reservation cost (based on their characteristics), at which they were willing to lend them. As such, informal sector lenders, using their information advantage, could effectively allocate credit more cost effectively and efficiently than formal sector lenders (Kimuyu and Omiti 2000). However, evidence suggests that the informal sector lenders, like their counterparts in the formal sector, set a fixed rate of interest and granted their loans in accordance with the characteristics of the borrower. This suggested that there was also credit rationing in the informal finance sector (Aryeetey 1998). Moreover, given the comparatively high market interest rate in this sector, the resulting credit rationing may not have been a conscious lending decision, but simply a consequence of high interest rates so that MSEs found it irrational to borrow funds at such prices.

The market

Since the credit market consisted of both the formal and informal sectors, the market supply schedule which confronted MSEs in developing countries was the aggregate of the two. The enterprise's decision on whether to use credit or not was based on an assessment of the anticipated reservation demand rate and the cost of credit. Given the two sectors, and considering their constraints, a MSE was more likely to choose the cheapest source of credit. The hypothetical aggregate market supply curve was horizontal as lenders set fixed interest rates regardless of the amount and characteristics of borrowers. It was expected however, that at the set interest rate, the market did not clear because there were some borrowers who demanded credit at a given interest rate but were still rationed.

Conceptual Framework

This section presents a theoretical model adapted from Boucher *et al*. (2009) with modifications to suit a borrower's application for credit in the credit markets in Kenya. The framework assumes a finance constrained entrepreneur operating in a competitive market requiring a credit facility to finance a fixed investment to enable production. It is assumed that the enterprise owns a minimal value of assets (A) and requires some financial support to engage in a particular line of business. The entrepreneur faces two outcomes in production: success (p) and failure ($1-p$), earning Y and 0 levels of income in the events of success and failure respectively. Apart from engaging in production (business), the enterprise has a reservation activity which involves renting out its initial assets to other players (who can use the assets) in the market at a consideration of w payment. The supply side of the credit market consists of risk neutral lenders who operate in a competitive market with $1+r$ opportunity cost of capital (lending). In order for the lender to be repaid, the borrower's business activity must be profitable as illustrated in expression 4.1. So that, given the lender's cost of capital, a firm's engagement in production is more lucrative than renting out its initial capital (Boucher *et al*. 2009).

$$(p)Y \geq 1 + r + w \qquad\qquad 4.1$$

Assuming a perfect information credit market where lenders can without cost observe the characteristics of the borrowers (with no adverse selection, moral hazard and enforcement problems), repayment outcomes predicted. The borrower's credit access in state j, C_j is;

$$C_j = [A + \{Y - (1+i)\}] \qquad \text{if } j = \text{success}$$
$$C_j = [A - k \ ] \qquad \text{if } j = \text{failure} \qquad\qquad 4.2$$

In the event of the financed project being successful, the borrower is expected to have the initial non-liquid assets (A) plus the difference between the project earnings and expected repayments. In contrast, a failure implies the borrower will lose all the collateral given to underwrite the contract (k). The lenders return is Rj: where:

$$Rj = [i - r] \qquad \text{if } j = \text{success}$$

$$Rj = [k-(1+r)] \quad \text{if } j = \text{failure} \qquad\qquad 4.3$$

Where i is the interest rate charged by the lender. The entrepreneur will repay $1+r$ if the project succeeds and k in the event of failure. The lender's return is the difference between the rate of interest charged and the return if invested elsewhere $(i-r)$ (Boucher *et al*. 2009).

Given the two states of nature, the optimal contracts can be resolved into the following maximisation problem:

$$MaxEU \quad (C_j)$$

Subject to;

$$1+i \geq \frac{i+r}{p} - \frac{1-p}{p}k$$

$$k \leq A \qquad\qquad 4.4$$

Since a rational lender expects to be repaid, Expression 4.4 represents the lender's participation constraints which ensure that he gets non-negative returns regardless of project outcomes. Expression 4.4 also provides the limited liability constraints indicating that the borrower cannot pledge collateral of a greater value than the value of the non-liquid assets of the business. The optimal contract for the borrower can therefore be derived using Expression 4.1 where the borrower is expected to earn the entire surplus subject to the constraints in Expression 4.4. Recalling the assumption of perfect information in respect of the financial market, the lender is expected to be indifferent between a trade-off of charging a higher interest or offering lower collateral of (1-p)/p (Boucher *et al*. 2009).

However, regardless of whether the lender is willing to trade-off higher interest rates with collateral at the same rate of *(1-p)/p*, the value of collateral pledged must be adequate to cover *(1 + i)* plus the expected cost of disposing of the asset constituting the collateral. Considering that lenders generally undervalue collateral pledged by borrowers, it means that not many MSEs are able to raise adequate collateral to fully insure the full value of their loan requirements.

Moreover, in Kenya, collateral can mean much more than merely the physical assets of a business. Thus, for instance, it is not unusual - especially in the informal finance sector - that a potential borrower's good name may be used to complement physical collateral. In this way, lenders may use the borrower's good name/reputation to gauge the prospects of receiving their repayment on time. Therefore, a borrower who cannot post the minimum required collateral plus other intangible "assets" of $A \leq \underline{k}$ (added constraint) are credit rationed.

The Model

The empirical literature review discussed the two methodologies that measures credit rationing. 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) 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. Although the model is based on Kochar (1997) and Swain's (2002) theories, it has been further adapted to the information available in the data.

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 1981; 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:

$$Y_i^* = x_i' \beta + \varepsilon$$

4.5

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. The estimated model takes the following format:

$CRss_{ij} = \eta_{ij} + \eta_{i2}LogEduc + \eta_{i3}Strata + \eta_{i4}Registration + \eta_{i5}Bus\text{-}type + \eta_{i6}Accounts + \eta_{il}Records + \eta i8Membership + \eta_{i9}Log\text{-}income + \eta_{i10}Tenure + \eta i11Structure + \eta_{i12}Resp\text{-}gender + \mu_i$

4.6

CRss is a credit supply dummy. *LogEduc*, *strata* and *Registration* represent the business owner's log of the number of years in school, business location (rural or urban) and whether the business was registered or not. *Bus-type* indicates the type of ownership of the enterprise, whilst *accounts* represent the prospective borrower's previous relationship with the lender and the influence that such a relationship had on the relationship. *Records* is included to reflect the effect of bookkeeping on credit access whilst M*embership*, *Log-income*, T*enure* and S*tructure* capture the member's influence on a credit or social group, business income, land tenure status of the business premises and the type of structure of the business premises respectively. *Resp-gender* captures the role of gender.

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:

$$Z_i = \beta X_i + \varepsilon; \quad y_{i1} = 1 \text{ if } z_{i1} > 0, \text{ otherwise } 0.$$

4.7

$Z_2 = \beta X + \varepsilon; \quad y_{i2} = 1$ if $z_{i2} > 0$, otherwise 0. $\qquad$ 4.8

[ε_{i1}, ε_{i2}]~ bivariate normal (BVN) *(0, 0, 1, 1, ρ)*

Where X_{i1} and X_{i2} are variable vectors determining access to credit (Z_{i1}) and demand for credit (Z_{i2}) 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_{i1} and y_{i2} (dummies representing credit access and demand respectively), the product $y = y_{i1} \; y_{i2}$ (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.

The estimated bivariate model takes the following form:

Demand$_{i2}$ Access $_{i1}$ = η_{i1} + η_{i2}LogEduc + η_{i3}Strata + η_{i4}Registration + η_{i5}Bus-type + η_{i6}Accounts + η_{i1}Records + $\eta i8$Membership + η_{i9}Log-income + η_{i10}Tenure + η_{i11}Structure + η_{i12}Resp-gender + μ_i $\qquad$ 4.9

The explanations are as previously defined in the univariate probit model (Model 1).

4.3.4 *Justification of the variables used and their measurements*

As explained in Section 3.3.4 a dummy variable to differentiate the micro-entrepreneurs who applied for credit and those who did not. For those who applied, some received the amount requested, some less, whilst others received zero credit. To differentiate the enterprises which got the full amount applied and which were rationed a dummy variable is used (if the enterprise got full amount = 1, and zero otherwise).

Regarding the attributes of the business owners - gender is a factor worth considering in the credit market. It is therefore interesting to gauge whether this variable (*gender*) measured in

binary form had any significant influence on credit rationing. As the theory of intertemporal consumption attests, lenders require borrowers to have some level of formal education (Soman and Cheema 2002; Lusardi and Mitchell 2011). To capture the influence of education in credit rationing, this study makes use of the number of schooling years (*educ*) of the owner of the business.

Apart from the business owners attributes, enterprises' characteristics were also critical in explaining various decisions affecting rationing (Swain 2001). Factors that affected rationing ranged from whether the business kept records, the structure in which they were housed, land tenure, the business type and their registration status. Many enterprise owners did not keep records, meaning that their operations were quite obscure (CBs *et al*. 1999). The information asymmetry arising from this lack of clarity complicated lenders' decision-making processes (Mordach 1999). To estimate the influence of this variable, a dummy variable *Records* is included to capture whether an enterprise maintained records of its operations.

In addition, the structural/physical development status of the enterprise premises illustrated the permanency of the business. A firm which operated on temporary and semi-permanent structures faced a higher probability of being credit rationed Carbo-Valverde *et al*. (2009). For example, Carbo-Valverde *et al*. (2009) found that in Spain an increase of 1% of tangible assets increased a likelihood of accessing credit by 0.045 %. For this reason, a *struct* dummy (permanent structure as 1 and zero otherwise) is used to capture the influence of this variable. Subsequent to the problem of structures, many enterprises operated without the required official registration by a relevant government body (*Registration*). It is therefore expected that registration status influenced the amount of credit accessed and, as such, a dummy variable is included to capture the influence of this variable in determining the extent of credit rationing. Subsequent to the nature of structures, businesses that operated from the owners' own premises stood a higher chance of accessing more credit than businesses that operated from rented premises - as owners who owned their own property could use the facility as collateral. A *tenure* variable measured in binary form is included to capture this effect.

A long-standing collaboration/relationship between the lender and the borrower enabled the lender to estimate probable types of risk which were capable of affecting the borrower's projected returns (Koppenhaver 1987). This explains why new entrants into the credit market are often subjected to more rigorous verifications prior to any loan endorsement, and are more prone to rationing than older establishments (Ikhide 2003). *A priori*, enterprises that maintained an account with the lender were expected to experience lower credit rationing outcomes (Cole 1998). This study captures the influence of this variable by including a dummy variable *accounts* in the model.

Preliminary data demonstrates that many MSEs were informally owned, as they were owned by one or a few members of a household without clear-cut definitions of owners' rights and responsibilities (CBS et al 1999). Those informal aspects dissuaded lenders from giving credit to such entities. To capture the effect, a partnership dummy (*Bus-type*) is included to capture whether solely owned businesses fare better than jointly owned businesses in accessing credit.

Other variables included are as explained in section 3.3.4.

4.4 Results, Discussion and Conclusion

The process of measuring credit rationing as described above requires a two-step estimation progression. Employing the STATA 8.2 statistical programme, this study initially estimated a Univariate Model to isolate the important factors which affected lenders' credit supply and the odds of an enterprise being credit rationed; whilst in step two, the Bivariate Probit Model with Partial Observability was estimated to capture the extent of credit rationing, given a positive demand.

4.4.1 *The Univariate probit estimation for credit access*

The first thrust of this chapter was to determine the probability of MSEs accessing credit given their characteristics. According to the estimation results contained in Table 6, 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.

Table 6: *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			

Note: * (**, ***) indicate significance at 1% (5%, 10%)

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 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.

4.4.2 *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.

Table 7: *Bivariate probit estimates of Demand and Access to credit*

Variable	Access		Demand	
	Parameter estimate	Std error	Parameter estimate	Std 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			

Note: * (**, ***) indicate significance at 1 %(5%, 10%)

As indicated in Table 7, 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.

4.5 Conclusion

The general consensus from this study (chapter three) 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.

CHAPTER FIVE

MITIGATION CREDIT MARKET FAILURE THROUGH GROUP LENDING

5.1 Introduction

The evidence eluded to in Chapter Two - and subsequently confirmed in Chapter Three and Four (first and second studies), indicated that MSEs in Kenya had difficulties in accessing credit in 1999. To ease the underlying problems, innovative schemes (group lending) was adopted in mid-2000 by the government supported programmes. However, the programme was adopted without a concrete foundation or results from previous studies. This study (Chapter Five) is essentially included to provide the theoretical and empirical foundation which is used to critique whether the problems highlighted in Chapter Three and Four (first and second studies) could have been eased by group lending. If so, then it could be construed that the change of lending policy from individual lending to group lending in Kenya in mid-2000 was prudent and was informed by theory and practice.

The remaining part of this chapter is organised as follows: Section 5.2 reviews the theoretical and empirical literature, Section 5.3 explains the sampling design, data collection methodology, the conceptual framework and the model used. Section 5.4 discusses research findings and Section 5.5 discusses whether the change of lending policy was justified.

5.2 Literature Review

Since the formation of the Grameen Bank by Prof Yunus in the early 1980s, solidarity group lending as a mechanism of lending collateral to financially constrained poor people has continued to elicit a substantial debate from a wide spectrum of society (Stiglitz 1990; Morduch 1999; Ghatak and Guinnane 1999; Ghatak 2000; Armendáriz de Aghion and Morduch 2005). Theories have since been propagated to explain its perceived success. Chief among them was that group lending mitigated against information asymmetry and reduced the cost of lending substantially. However, empirical investigations revealed mixed performance on credit repayment in developing countries (Morduch 1999), meaning that not all aspects of group lending stimulated successful repayment. This section therefore reviews prominent historical

theoretical and empirical perspectives presented in various studies to deduce whether sources of market failure associated with MSE financing could have been mitigated by group lending.

However, since group lending with joint liability operations borrows heavily from Rotating Savings and Credit Associations (ROSCAs) and Grameen Bank Lending Model, it is critical that the fundamentals that contribute to these two institutions' success be discussed before presentation of theoretical perspectives on group lending successes.

5.2.1 *Foundations of group lending: Rotating savings and credit associations*

To appreciate the workings of group lending in mitigating against the problems associated with information asymmetry in credit markets, the insights offered by the experiences of an institution where incomplete contract theory is practised may prove informative. Long before the group lending innovation by micro lenders, which is a relatively 'recent' phenomenon, many people and MSEs accessed credit from informal finance institutions. These institutions are still in existence and they complement the more established formal finance sector. Among the prominent informal institutions found around the world are the Rotating Savings and Credit Associations (ROSCAs).

A number of studies have demonstrated the importance of ROSCAs in savings mobilisation across the world. For example, Besley and Levenson (1996) investigated the role of ROSCAs in durable goods accumulation in Taiwan. They found that, despite the country being of a middle-income economy, about a fifth of Taiwanese people participate in ROSCAs activities. The study also found a significant link between the said informal financial institutions and accumulation of durable goods by the households. This they attributed to the inadequacy of formal finance institutions to serve the interests of all the Taiwanese people. Such attributes were also found in an earlier study by Bouman (1995), who reported that the majority of the non-urban population in six West African states of Nigeria, Cote d'Ivoire, Togo, Liberia, Cameroon and Congo participated in ROSCAs.

ROSCAs are generally formed when like-minded people, typically friends or neighbours, or who in some cases work for the same employer, form groups so that they can enjoy the benefits associated with savings, insurance and credit (Besley and Levenson 1996). Just as the name suggests, the members of a particular group gather in a series of meetings where they make regular contributions to a common kitty. The collected funds are distributed to members on rotational basis depending on an agreed formula. However, in some cases the full amount contributed is not distributed to members. A portion is retained as group savings, which is later used as a source of credit to members and as a precautionary fund in case of unforeseen contingencies. Despite the fact that most ROSCAs have no formal contracts/mechanisms to guide their activities, the intra-group dynamics define their formations, operations and contract enforcements and hence make the informal contract work (Paxton 1996). The aim of Section 5.2.1 is therefore to outline the workings of these incomplete informal contracts and how they have influenced the development and success of group lending.

Given that these institutions are common in most parts of the world and given also that their operations are informal, it is important to investigate their contract enforcement mechanisms which may hold lessons for group lending. Brousseau and Glachant (2002) defined an economic contract as an agreement in which two parties make mutual pledge in terms of their actions, generally in the presence of asymmetric information. They argue that, though the term is mostly used in reference to legal concepts of contracts, it can also encompass incomplete contracts. The legal/formal contracts adopt the standard neoclassical contract theory which presumes that economic agents are endowed with rationality and possess perfect information when undertaking contractual agreements. Under this theory therefore, the optimal contracts boil down to a principle/agent problem that specifies each party's obligations (Hart 1995). This implies that for each state-contingent, every possible outcome is predicted and a different contract is negotiated at the on-set and each party made aware of their obligations and possible implications in each case, including default.

A number of reasons explain why the standard neoclassical contracts find limited applicability in informal finance contracts like ROSCAs. In the first instance, the assumption that the parties can estimate all possible outcomes so that they set appropriate contract clauses to mitigate each undesirable outcome is farfetched. Due to asymmetric information prevalent in these markets, it

is quite difficult for the two parties to imagine all contingencies. In addition, it is costly to negotiate each state of affairs so that each member is aware of the possible consequences arising from each predicted outcome. Besides, it is not possible to predict all contractual outcome and legally write every agreement for each state of affairs (Paxton 1996).

Faced with such immense difficulties in formulating formal legal frameworks, most informal finance contract settlements rely mostly on informal mechanisms of contract enforcement, which Brousseau and Glachant (2002) refer to as an incomplete contract. The incomplete contract theory postulates that complete contracting between two parties is ineffective as it is not possible to verify *ex post* all future actions of the parties. Variables like the effort invested in the success of the project and monitoring the amount of production are, for example, difficult to authenticate and therefore make contracts based on these unverifiable variables difficult to undertake.

Incomplete contracts fill this gap by allowing the parties to enter into flexible contractual agreements, where the members' actions are judged only by the provisions of the exact contract terms drawn by them, although it takes into account unforeseen emergencies (Brousseau and Glachant 2002). For example, within ROSCAs, it is an acceptable practice for members to empathise with their colleagues who encounter a misfortune like death in the family. This means that other members may not penalise the affected member in case of defaulting on a contractual group obligation. Allowing diverse outcomes to determine the actions taken against a member means an incomplete contract is more realistic in explaining contractual arrangements to which were agreed in informal credit markets in developing countries.

The next focus is to appreciate how ROSCAs groups enforce contractual obligations using incomplete contracting theory. The intra-group characteristics and activities of ROSCAs vary considerably across the world as it "tends to permeate different cultures and all socio-economic classes" (Paxton 1996 p. 5). The groups' formations and enforcement mechanisms are similar and underlie the working of incomplete contracts. As already noted, the group's formation starts when members who have close social ties develop social networks, and common aims which they jointly want to achieve. This closeness assists in reducing informational related problems associated with adverse selection, monitoring and contract enforcement. These attributes (which are central to the functioning of ROSCAs contract enforcement) have been documented by

authors like Armendáriz de Aghion and Morduch (2005) and Gugerty (2003). The literature suggests that ROSCAs successes are embedded in the socio-cultural foundations and practices of members of various societies. Since these neighbours have come to know each other well, it means that each person is well aware of the other's strength of character, their potential, and/or weaknesses, and as such, people who are not honest or creditworthy are easily removed from the ROSCA. This eases against adverse selection.

In the event that a person who is not a member desires to enter into an existing group, a stringent process is followed. The interested member must begin the application process (which can be written or verbal and submitted via an acquaintance member of the group). If a new member is admitted into a group, the member who acts as his or her referee is expected to be their mentor and can be held accountable in case of the new member's 'misbehaviour'. This aspect discourages members from recommending people with questionable characters from joining the group.

Second, being 'neighbours' also mitigates against credit market problems associated with monitoring of the usage of the borrowed funds. Gugerty (2003), for example, reports that neighbours and friends form most of the ROSCAs in western Kenya. He also reports that on average, the members visit each other fourteen times per month on other business related matters not associated with the activities of the group. Two propositions can be made from this finding. Firstly, the regular interaction among members makes monitoring easy and less costly. Members, by virtue of proximity, know each other's activities and can easily veto an activity if they deem it inappropriate in furthering the welfare of the group. The group's members meet on a regular basis which discourages members against moral hazard as it encourages a mutual monitoring type of structure, where all members monitor each other simultaneously. Secondly, regular meetings and contributions enable the members to monitor and take remedial measures early in case a member has a problem.

The other source of ROSCAs success is the mechanism the group uses to enforce repayment. Ordinarily, members contribute payments during their regular meetings that are mostly held in members' homes. Amendáriz de Aghion and Morduch (2000) argue that regular contributions/payments encourage members to honour their commitments and, furthermore, it is

easier for a member to pay small amounts at regular intervals than large sums at the end of every month. Moreover, due to the utility derived from having a good name in a close-knit society, members tend to go to extreme lengths not to disappoint their colleagues. The practice of holding group meetings in members' homes is also partly intended to reduce defaults in payments, as when the defaulting member is being discussed in their own home, it increases discomfort and humiliation for them. Members can also impose social sanctions against a defaulting member; which can range from 'village' gossip to impounding the defaulter's domestic assets (Morduch1999).

Due to the aspect of near perfect information contained in ROSCAs contractual operations and enforcement of contracts, members are able to judge the merit of every outcome and also avoid undesirable outcomes. This means that outcomes which are seemingly the same are treated differently depending on the underlying reasons contributing to the problem. Such are the subtleties on which the contractual relationships undertaken by ROSCAs are based.

Although ROSCAs have proven successful in mobilising savings and credit, it is incorrect to assume that they operate without some operational difficulties. As noted by Amendáriz de Aghion and Morduch (2005), the value of credit typically advanced by these groups is relatively small and they may run into payment difficulties if they attempt to meet the full credit requirements of members. Furthermore, efforts to increase the value of credit payments by encouraging increased membership can create group management problems, as large groups are more difficult to manage. Nonetheless, ROSCAs and other informal financial finance institutions have proved that informal contracts can hold (Gugerty 2003).

Although group lending fundamentals are similar to ROSCAs, their success rate differs (Paxton, 1996). Two reasons underpin the disparities (Paxton, 1996). Unlike ROSCAs, micro-finance group lending borrows money from an external source, which translates into different levels of effort expended by members when monitoring the financed projects and enforcing repayments. Second, distinct from ROSCAs, the main organiser of groups in micro-finance lending (though nominally this is the duty of the chairperson) is the programme credit officer, a person detached from the community. These two overlapping differences alter the group's dynamics and incentive structures between the two systems.

5.2.2 *The Grameen Bank Lending Model: The Origin and Critic*

For the last three decades, many micro lending programmes (and institutions) were created all over the world following a successful lending model (group lending) associated with the Grameen Bank. These institutions were created with the aim of providing credit-to-credit constrained MSEs without the stringent requirement of collateral provision (Morduch 1999).

Several reasons were suggested to explain how the Grameen Bank Lending Model led to this success. Group lending contracts effectively make borrowers co-partners to loans, thus mitigating problems created by informational asymmetries between the lender and borrower. Partners with micro credit had incentives to monitor each other and exclude risky borrowers from participation, promoting repayment even in the absence of collateral. Non–payment by one member meant that all members of that particular group were held responsible. This principle of joint liability created an incentive mechanism where every member had an interest in selecting his/her peers and monitoring their projects to make sure that they had the capacity to pay their portion of the loan. The joint liability aspect in these arrangements motivated co-borrowers to put pressure on potential defaulters.

Similarly, under the Grameen Bank Lending Model, group rather than individual lending, reduced the costs of administrating loans (Stiglitz 1990; Ghatak and Guinnane 1999; Ghatak 2000). This was possible since group lending consolidated many micro-loans into a few large group loans, greatly reducing the cost incurred by the lender in processing and monitoring. In addition, most of the lenders' costs incurred in assessing the creditworthiness of the borrowers were passed on to the group (Armendáriz, Aghion and Morduch 2005). Nevertheless, the higher probability attributed to accessing credit could not be entirely attributed to the joint liability aspect alone. Group lending was just a part of the set of mechanisms employed by the Grameen Bank Lending Model to aid credit repayment. Armendáriz de Aghion and Morduch (2000), for example, indicated that direct monitoring, regular repayment schedules, and the use of the threat of non-refinancing was used to influence group repayment. Bruton *et al*. (2011) introduce another dimension by arguing that the real course of high success in group lending is still not known. They argue that few studies in management have attempted multi-country research to understand micro lending. They contend that for one to understand group lending dynamics,

in-depth case interviews should be used to give voice to the individual borrowers and to contextualise their business decisions. This gives credence to the argument that this study area is still not explicitly understood.

5.2.3 *Theoretical perspectives on group lending success*

Though much theoretical literature focused mainly on joint liability lending as the main driving force (Ghatak and Guinnane 1999; Stiglitz 1990; Ghatak 2000), the importance of programme innovation in aiding credit repayments cannot be underrated (Armendáriz, Aghion and Morduch 2005). In this regard, this section seeks to explore the two overlapping sets of historical theoretical perspectives underlining the group's lending mechanism.

Theories of joint liability lending

Pioneering articles published in the 1970s identified asymmetric information as a main cause of market failure (Akerlof 1970; Alchian and Demsetz 1972). Akerlof (1970), for example, argued for the importance of guarantees in business as a precondition for trade and production, particularly in markets prone to asymmetric information. He further argued that in circumstances where these guarantees are incomplete, a business may suffer because of economic costs associated with dishonesty. Alchian and Demsetz (1972) similarly asserted that, given a situation in which monitoring proved costly, members participating in a joint activity tended to give less than their level best than when their efforts can be monitored more easily.

Although Akerlof (1970) and Alchian and Demsetz (1972) did not refer to a specific market, their common agreement was that asymmetric information was the principal source of market failure. Nevertheless, several theories have since emerged to explain the idea that group lending with joint liability helped to overcome the information and enforcement problems associated with credit markets in developing countries (Stiglitz 1990; Varian 1990; Ghatak and Guinnane 1999; Ghatak 2000). To clarify this success, the models employed the principal/agent theory to explain the lenders' ability to minimise risk by transferring part of the selection, monitoring and enforcement cost to the borrowers.

The specific historical aspect of group lending which contributed to this success remains open to debate (Morduch 1999). Some scholars mentioned the groups' ability to mitigate against adverse selection, moral hazard and enforcement of credit repayment as the main reason group lending mechanisms had impressive general repayment rates (Ghatak and Guinnane 1999; Stiglitz 1990; Ghatak 2000). However, although there was a near agreement that group lending worked, economists were yet to agree on which group characteristics specifically mitigated the problem of ensuring credit repayment. Understanding how the joint liability aspects of group lending helped to mitigate the problems of adverse selection, moral hazard and enforcement - as emphasized in Chapter Three and Four, - initiated the first step of isolating specific group characteristics which may have reduced the problem of credit access (adverse selection, moral hazard and enforcement).

Group lending and adverse selection

Many historical studies have since found that the adverse consequences of asymmetric information, such as adverse selection, were mitigated in the context of the tightly knit social structures of society in less developed countries (Ghatak 2000). This view is informed by the fact that borrowers in a particular community possess superior information in respect of their neighbours' and acquaintances' characteristics when compared to a conventional lender, who in most cases, was not familiar with a borrowers' characteristics. This explained why lending through group networks had a higher probability of success than did a typical formal financial sector institution. Thus, the ability of group members to self-select themselves based on information embedded in social networks reduced the problem of adverse selection. A number of historical studies have demonstrated this aspect (Ghatak and Guinnane 1999; Stiglitz 1990; Ghatak 2000).

Ghatak and Guinnane (1999) argue that a well-structured group-lending programme deals more effectively with adverse selection problems than conventional lenders. To illustrate this sorting process, Ghatak and Guinnane use a simple model with the following assumptions: There are two types of borrowers, (*a*) 'safe' and (*b*) 'risky' with uncorrelated projects whose output (*y*) takes two values, high (y^H) and low (y^L) where $y^H > y^L \geq 0$ (he normalises y^L to zero for simplicity). The probability of high output is p_i, $i = a, b$ and $p_a > p_b$. *r* is the gross interest

(principal plus the net interest rate). *c* is the additional amount a member pays to the bank after his partner defaults – this arises due to the joint liability feature in their repayment contract with the lender, where the two partners are jointly liable for the repayment of the loan. To illustrate how the sorting process worked, Ghatak and Guinnane modelled the expected payoff of the two types of borrowers. The net expected gain to a 'risky' borrower from having a 'safe' partner is shown to be:

$$[\text{illegible equation}] \tag{4.1}$$

Moreover, the expected loss for a 'safe' borrower by teaming up with a 'risky' borrower is modelled as:

$$[\text{illegible equation}] \tag{4.2}$$

Given that $p_a > p_b$, is the expected loss for a 'safe' borrower to team up with a 'risky' borrower; the net expected gain of a 'risky' borrower teaming up with a 'safe' partner is therefore greater. This implies that if a 'risky' borrower forms a credit group with a 'safe' borrower, then the latter will subsidise the former which is clearly untenable. This leads to the sorting outcome in which a 'safe' borrower has no incentive to partner with the 'risky' borrower.

The notion behind the Ghatak and Guinnane model is as follows: If a group was formed by a number of borrowers who could be classified into different risk categories, a 'low-risk' borrower could end up subsidising the 'high-risk' borrower. In order to team up as a group to secure credit, a 'low-risk' borrower could demand compensation from the 'high-risk' borrower in order to accept them as a partner. However, the Expression 4.3 implies that such a payment would have to be higher than what the 'high-risk' borrower was prepared to make, as it would be expected that they pay more than the net benefit accruing from the partnership.

$$[\text{illegible equation}] \tag{4.3}$$

This means that neither the 'risky' borrower nor the 'safe' borrower would be prepared to partner each other. Since borrowers automatically veer towards like-minded people and therefore tend to form a group with similar needs and risks (Ghatak and Guinnane's 1999). Ghatak and Guinnane's (1999) study can be commended for illustrating that joint liability lending leads to assortative matching where borrowers of the same type group together. This enables 'low-risk' borrowers the enjoyment of accruing benefits from consistent credit repayments.

Other authors highlighting the role of group dynamics in influencing assortative action include Stiglitz (1990) and Ghatak (2000). According to Stiglitz, credit groups acted like cooperatives where the action of one member affected others. However, the aspect of cross-subsidisation decreased as the members sorted themselves out depending on their risk type. Stiglitz argued that assortative matching occurred when low-risk members recognised the mutual benefit of forming groups with diverse needs, as they would benefit from the expected higher project returns. He asserted, however, that the assortative processes continued and generated an equilibrium position where members with similar type of risk grouped together.

Similarly, Ghatak (2000) demonstrated a contractual mechanism through which lenders utilised the information the borrowers had about each other. He showed that with joint liability self-selected groups of borrowers produced higher repayment rates than individuals. Ghatak (2000) asserted that under joint liability, the deliberate creation of externalities through joint liability induced members of the group to select their peers based on the superior information advantage they possessed. In this case, the information embedded in communities allowed members to group themselves according to borrowers' credit records, character traits and expected project returns. The resulting assortative matching of 'safe' borrowers signalled the group's creditworthiness and reliability to the lenders. Wenner (1995: 265) for example, noted "the 'poorer risks' found it too costly to 'signal' so they were excluded from the incentive scheme and were either forced to do without credit or seek loan contracts with higher interest rates". These assortative matching properties among the borrowers enabled the lenders to gauge the risk type of respective groups and advanced credit according to the risk profile of the group.

Alongside assortative matching processes, group lending assisted in reduction of adverse selection by determining the amount of loan each individual borrowed. Unlike conventional lending, the group's prerogative was to determine the maximum amount of credit to which each member was entitled. Adverse selection was minimised since the group members were in a position to know each member's ability to repay. This greatly reduced the prospect of some borrowers demanding more credit than they would be able to utilise and repay.

Group Lending and Moral Hazard

Once credit was granted, the project payoff partly depended on the borrower's level of effort that they put toward the success of the project. However, it was not always possible for the lender to monitor borrower's effort. Some borrowers simply failed to apply themselves diligently to their projects/business ventures (moral hazard); others used the loan for other purposes than that originally intended, which compromised their ability to repay.

Group lending minimises moral hazard. Two reasons are given to explain this outcome. First, in this type of lending, borrowers usually interacted in close business and social circles, and as such, had the ability to acquire personal information of each other easily and at minimal cost. Second, since all members of the group were held equally responsible for non-payment of the entire loan, everyone within the group had an incentive to monitor each other's investment and activities. This transfer of risk from the lender to group members had the element of inducing peer monitoring among members, thereby transferring part of the costly monitoring effort, normally incurred by lenders, to borrowers.

A considerable number of theoretical contributions attest to the ability of group lending in reducing moral hazard (Besley 1995; Conning 1999; Varian 1990; Madajewicz 2011). Conning (1999) compared three broad channels of monitoring credit usage: monitoring by the financial institutions, delegated monitoring-where a lender delegates part of the monitoring to a third-party and peer monitoring. He asserted that a feasible monitoring contract was the one that allowed the lender to break even, and provided both the borrower and the delegated monitors with incentives to participate and select appropriate levels of diligence. Moreover, he argued that for a lender to give credit, the expected return had to be high enough to cover not only the opportunity cost of

money, but also the cost of monitoring and enforcement. To illustrate this argument, he compared three channels of monitoring by modelling their respective expected project returns. His finding supported the theory that peer monitoring was cheaper compared to other available channels of monitoring.

Conning (1999) argued that the monitoring advantage in joint liability lending was derived from the ability of the contract to induce the borrowers to play a simultaneous role of being a monitor and being diligent stewards of their projects at the same time. He asserted that the joint liability contract provided incentives to borrowers when their projects succeeded and also encouraged them to assume maximum liability when the projects failed. Rewarding the joint outcome of success provided enough incentive to make borrowers exercise due diligence in monitoring. Therefore, the incentive to monitor was induced by the same contract terms that rewarded diligence, an aspect which enabled the lender to save on that portion of total cost of lending. Conning's argument is supported by Madajewicz (2011) who argues that the poorer borrowers (who mostly operate SMEs) are more efficient monitors than the lender even when the lender and the borrowers have access to the same monitoring technology and even when the borrowers and the lender have the same costs of monitoring per unit of effort. This he attributes to the level of intense monitoring among the poor people. However, Madajewicz (2011) argues that the level of monitoring is inversely related to wealth accumulation after some critical point. This is attributed to the diminishing utility of having collateral to wealthy people.

Varian (1990), using principle/agent theory, explained the ability of lenders to minimise the problem associated with moral hazard by transferring part of the monitoring cost to the agents. The author showed that where agents 'insured' each other across the state of nature, the lender was better off since agents tended to monitor each other more diligently. He demonstrated that it was beneficial for the lender to delegate some monitoring cost to borrowers who had a mutual interest in the success of their project.

Besley (1995) concluded that a group functions effectively where formal institutions have failed. This he asserted was through exploiting its comparative advantage in monitoring and enforcement that is acquired by members in the process of interaction in a variety of non-market contexts (e.g. social occasions). The interaction and close proximity make each group member to

monitor each other more effectively than formal institutions or other types of delegated agents would do.

Group Lending and Enforcement

The last problem that confronted a lender was the enforcement of credit repayment after the borrower's projected returns had been realised. Ordinarily, many lenders required collateral before granting credit in order to "hedge their bets" against non-repayment, a requirement that ended up discriminating against many MSEs. Group lending with joint liability circumvented the need for collateral since the joint liability component in those programmes encouraged members to enforce repayment by exerting peer pressure and using social sanctions on the defaulters. A number of studies have been put forward to explain this success (Banerjee *et al*. 1994; Besley and Coate 1995; Besley 1995; Ghatak and Guinnane 1999; Bhole and Ogden's (2010)).

Besley and Coate (1995) conducted a theoretical repayment game for joint lending which illustrated how group formation could lead to the presence of both positive and negative aspects of group lending when compared to individual lending. The group's positive effect resulted from the fact that, if one member's project failed, other members whose projects obtained sufficient returns could repay the loan on behalf of the member whose project had failed. The negative effect arose if the entire group defaulted. A group could have defaulted when there was collusion among members when they agreed not to repay the credit and suffer the expected consequences together. In addition, group default could have been triggered by a 'domino effect[10]' where one defaulting member caused the others to default; a phenomenon that has been termed by Brock and Durlauf (2007) as the "endogenous peer effect".

To illustrate the presence of endogenous peer effect, Besley and Coate (1995) developed three possible scenarios which showed the positive and negative factors that determined group credit repayment schemes. First, when each borrower had a lucrative project, the lender was repaid (Besley and Coate illustrated with two a member group). This did not, however, prevent one

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[10]   The domino effect is the negative externality associated with group lending. According to Besley and Coate's (1995) group repayment game, the default of one member can lead to a secondary default of a partner who could have otherwise repaid an individual loan.

partner from free riding. However, when social sanctions were introduced, the only asymmetric equilibrium was where both borrowers repaid their shares, since a borrower who free rode on the good returns of their partner incurred social costs. Hence, when social sanctions were incurred, both partners ended up contributing their share.

A second possibility was that each borrower's earning capacity could not repay the full amount borrowed by the entire group. Two outcomes were possible: mutual contribution and mutual non-contribution. In the first outcome – mutual contribution, the lender received his money, while in the second outcome – mutual non-contribution, he did not. In this case, neither borrower found it worthwhile to repay the whole loan and as such defaulted on their agreement (domino effect). Moreover, each borrower was willing to repay their share of the group loan, if and only if, their partner also paid back their share. This meant that a mutual contribution required solving a combination of problems, an aspect which favoured individual lending, since under individual lending the lender received payment from each borrower regardless of whether the borrower's partner had repaid. However, the inclusion of social sanctions influenced each borrower to repay their portion of the loan, since non-repayment induced social penalties. This meant that in group lending, group coordination and the severity of social sanctions are vital factors to enforce repayment.

The third scenario arose when one member's projected return could repay the group loan but their partner's return was unable to fulfil their obligation. This favoured group lending since there was a possibility of the lender being paid all his/her money as the borrower who was able to repay the lender may pay their less fortunate partner's share (group solidarity). Nevertheless, the existence of social sanctions made it less likely for the partner with the better returns to pay the entire group's loan.

The underlying conclusion that arose from this interactive process showed the two countervailing effects of group lending. On one hand, there were positive factors which contributed to group repayments. These factors included group solidarity and social sanctions. On the other hand, group repayment could have been hindered by the problems associated with the domino effect and free riding.

Besley (1995) argued for the supremacy of group lending over individual lending brought about by existing social collateral in communities of developing countries. He asserted that the presence of social collateral limited antisocial behaviour with its ability to punish the defaulting members regardless of whether a group had a written contract or not. The formal financial credit market where default cases were usually subjected to drawn out legal tussles did not promote this social advantage. According to Besley, informal sanctions had more severe effects compared to formal sanctions. Formal sanctions included liquidating the collateral posted for the loan whereas informal sanctions went further and included social sanctions and sometimes, family sanctions.

Banerjee *et al*. (1994) noted that close social ties and interaction fostered non-opportunistic behaviour which prevented members from defaulting without accountability. They asserted that these groups were sustained by continuous social interaction among members, such that any short-sighted behaviour which a member might have undertaken at the expense of the other members was curtailed at an early stage. They proposed that well designed credit arrangements where members have long-term stable relationships or are able to identify with the collective good was necessary requirements for high repayment rates.

Although social sanctions encouraged compliance of group loan repayments, the severity of these sanctions had a great influence on credit repayment schemes. In some cases, for various reasons, which ranged from kinship to religion, members were at times unwilling to put pressure on fellow members and sanction those who defaulted. In other cases, the punishment applied was not severe enough to discourage against default. To demonstrate the importance of adequate social penalties of group lending, Ghatak and Guinnane (1999) illustrated a model with the following assumption: a group consisting of two risk averse borrowers who can default intentionally, each with a project return of y*,* and *r* is the rate of interest charged by the lender. y*(r)* is the critical level of income, representing the minimum level of income which the borrower is willing to repay and is determined by the borrower's marginal utility of income. The borrower will repay only when *y>y(r).* This, they explain, arises from the diminishing marginal utility of income for a given level of *r.* If the returns are not sufficiently high, repayment is costly because the marginal utility of income is high.

Ghatak and Guinnane argued that social sanctions reduce the attraction of non-repayment in the case where one partner defaults intentionally as in when their project return is sufficient to repay the loan [y(r) > y > r], and the other party is willing to repay their share but not their partner's share [y(2r) > y > y(r)]. To make the former contribute their portion of the loan liability, they argued for the application of adequate social sanctions to increase the marginal disutility of defaulting and decrease the perceived critical income level in such a way that [y > y(r) >r]. This is consistent with Besley and Coate's argument that a borrower will compare the sum of the social penalties and those that will be inflicted by the lender with what they are expected to pay. This means that the borrower will weigh-up the consequences, withstand some penalties and willingly default.

The results of Bhole and Ogden's (2010) study complement Besley and Coate's (1995) study and observe that, unless group members are able to impose costly social sanctions on one another, group lending might be worse off than individual lending. Bhole and Ogden (2010) suggest that, in the absent of these conditions, group lending can only be superior to individual lending if the penalty is allowed to vary across group members.

The literature demonstrates that strong social ties among group members and credible threats of social penalties against a defaulting group member produces an equilibrium in which group lending is able to reduce defaults in credit contracts. Therefore, it can be hypothesised that credit repayment will differ depending on the strength of social ties and the type of social penalties imposed against defaulters. In addition, group lending required solving coordination problems to prevent free riding and domino default effects in credit repayment.

The role of programme innovation
Although the joint liability aspect in micro lending has been given prominence by many authors as the most important factor in inducing high levels of credit repayment in micro-finance schemes around the world, it is not prudent to assume that it was the only factor that drove the repayment results. Group lending with joint liability was just one part of a set of overlapping mechanisms employed by lenders to aid loan repayment (Armendáriz de Aghion and Morduch

2005). For example, Giné and Karlan's (2010) study in the Philippines examined the impact of joint liability through two randomized experiments of group and individual lending – both with obligatory periodical repayment meetings – and found no major difference between the two. Similarly, Attanasio *et al*. (2011) analysed comparative experiential evidence on the merits and demerits of the two systems of lending from borrowers' perspectives in Mongolia. They found no significant difference. The assertion here is that probably the real course of group lending with joint liability being 'perceived' as successful is not known and as such the future of micro-finance rests in understanding the "alternative mechanisms, reconfiguring them and combining them with new emerging ideas" (Armendáriz de Aghion and Morduch 2005: 114).

Rai and Sjöström (2004) argued that joint liability aspect of group lending was unlikely to hold in practice, and that it was in fact dominated by innovative contracts, which elicited truthful information from borrowers through cross-reporting mechanisms, employed and encouraged by the lenders. To encourage high repayment rates, micro-finance institutions employed other mechanisms to supplement joint liability contracts (Rai and Sjöström 2004). The mechanisms included: dynamic incentives, encouraging regular credit repayments and advancing credit sequentially. This section presents the argument that the successes of group contracts were partly driven by innovative lending mechanisms.

Many group lending schemes insist on regular repayments (Yaron 1994; Armendáriz de Aghion and Morduch 2000). Insisting on immediate repayment on a weekly basis meant the micro-finance lender was partially lending against the household's stream of "outside" income and not just the proceeds from the financed project. This could have led to high credit repayment by borrowers, not necessarily from their successful projects but because the lender was able to tap the stream of outside income (Armendáriz de Aghion and Morduch 2000). This argument is reinforced by the fact that many borrowers were micro- entrepreneurs who earned their income on a daily basis. Their income was spent as fast as it was earned due to lack of a satisfactory savings mechanism and due to many unfulfilled competing basic needs. This meant that their income erosion rate was very high compared to well-established entrepreneurs who could afford savings facilities (Armendáriz de Aghion and Morduch 2000).

Usually, a problem detected early was easier to solve than a problem detected at a later stage. In this regard, regular credit repayments were used as a screening device for detecting possible delinquent borrowers (Yaron 1994). Early warning enabled the lender to develop early strategies to counter the growth of the problem. Again, close interaction between the lender and the borrowers during regular credit repayment meetings enabled the lender to establish a personal relationship with the borrower. This mutual relationship encouraged openness and eventually decreased repayment default (Armendáriz de Aghion and Morduch 2000). Moreover, in those regular meetings, the borrowers were required to repay their loan instalments and make some savings deposits to their respective group accounts (K-REP 2000). The savings aspect was intended to inculcate a saving culture out of daily competing needs. At the same time, the more the borrower saved the less likely they were to default, since a default may have led to loss of the entire savings. For this reason, a weekly savings scheme had the effect of encouraging prompt repayment from borrowers (Armendáriz de Aghion and Morduch 2000).

The second method lenders used to encourage credit repayment was the use of the dynamic incentive (Paxton *et al* 2000). Dynamic incentive represents the threat of cutting off subsequent loans to defaulting borrowers (Paxton *et al* 2000). It has been argued that a lender can enhance the effect of dynamic incentives by promising to extend steadily larger loans to the borrowers who honour their repayment. Armendáriz de Aghion and Morduch (2000), for example, argued that since borrowers typically desire more substantial loans, the promise enhances the borrower's loss from being cut off from the subsequent loans. This method motivated them to pay their previous loans as agreed in the contract.

Third, in order to prevent possible collusion and to minimise moral hazard behaviour among the borrowers, many lenders also formulated other mechanisms, which encouraged the borrowers to monitor each other and enforce prompt credit repayment. In some programmes, credit was granted sequentially instead of the widely used simultaneous lending (Varian 1990; Aniket 2004). In simultaneous lending, the lender granted credit to all members of the group at the same time, whereas in sequential lending, members of the same group received credit at different times and in a sequential manner. Subsequent credit was given to the next member in line, on condition

that the members who had received the credit earlier were judged to have successfully repaid (Varian 1990; Aniket 2004).

Several reasons explained the superiority of sequential lending. Under simultaneous group lending, borrowers received credit at the same time, and were expected to repay at the same time. This process was prone to *ex ante* and *ex post* collusion among members, as in some rare cases, members could collude and apply for credit with the intention of defaulting. In other cases, where the cost of monitoring was higher, simultaneous credit lending could lead to poor monitoring since all members were supposed to be monitoring each other and also be monitored at the same time (Aniket 2004).

Varian (1990) asserted that sequential lending arrangement provided incentives against defaulting by placing various agents in different cycles of credit needs. Thus, borrowers who were being considered for credit exerted pressure on other borrowers who had already obtained loans to repay so that they in turn, could qualify. Second, since borrowers naturally demanded higher credit in the subsequent credit cycle, those who had repaid loans would also exert the same pressure on agents who received later credit.

Therefore, it can be concluded that apart from group dynamics, the success of group lending in the credit repayment schemes can also be attributed to the programmes innovativeness. It is expected that group repayments differed across credit programmes depending on the nature of the credit programme's design. It is therefore important to assess whether the changes in credit policy by the Kenya government factored these programme dynamics.

5.2.4 *Determinants of group loan repayments: an empirical review*

Though various arguments have explained group repayment performance, the focus of this section is on the application of these theoretical perspectives to group lending in predicting the group loan repayment rate, (given the different group characteristics and lender incentives). Since Besley and Coate's (1995) seminal paper, several other empirical studies have attempted to explain the role of these factors in determining loan repayment. These studies include: Wenner

(1995); Zeller (1998); Wydick (1999); Paxton *et al*. (2000); Sharma and Zeller (2004); Karlan (2007) and Shanjun *et al*. (2012).

Adapting Besley and Coate's two-stage repayment game models, Paxton *et al*. (2000) utilised a mean-covariance structural model to estimate the determinants of successful repayment among 140 credit groups drawn from Projet de Promotion du Petit Credit Rural (PPPCR), a group-based lending programme in Burkina Faso. The dependent variable in stage one is a dummy variable indicating whether an individual member had a repayment problem. In stage two, the dependent variable also took the form of a dummy variable but that was used to capture whether a group with at least one member who had a problem in stage one managed to pay the lender through group solidarity.

The explanatory variables were measured in binary or categorical forms. The homogeneity index was constructed out of responses to nine questions relating to socio-economic characteristics within each group, and was used to measure group homogeneity. Leadership and training of the group was measured as a binary variable with the group reporting whether they were either satisfied or dissatisfied with their group leadership. To capture the domino effect on credit repayment, the authors tallied the number of individuals in the group who had some difficulties repaying their loan, and whether a group existed within the village that had defaulted. In order to analyse the impact of the loan cycle on repayment, they counted the number of loan cycles per group. The measure of peer pressure was constructed out of a series of open-ended questions which helped to measure the level of disutility that group members' suffered when one of them defaulted (Paxton *et al*. 2000).

Their findings suggest several areas of instability in the group loan repayment process. In stage one, variables such as the member homogeneity and the domino effect and the urban dummy variable were found to be significant determinants of being associated with repayment problems. This is contrary to what is expected, as it is assumed that groups formed by members who are homogenous have a strong sense of conviction and shared commitment which enables them to carry out the project more diligently for fear of disappointing their close associates. Members of homogeneous groups also develop common bonds that enable them to form close-knit groups,

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whose members are able to monitor one another at a minimum cost (Paxton *et al*. 2000). Paxton *et al*. (2000) rationalises this divergence as arising from the effects of covariant risk that affect members undertaking similar economic activities, especially in the rural areas.

The domino effect was found to have a significant positive effect on repayment problems, implying that one member's default caused other members to default. This was expected in view of the fact that under joint liability lending, members are jointly responsible. The urban dummy variable was found to be negative with a low standard error and a strong significant effect. This is attributed to the heterogeneous nature of activities carried out by members in an urban environment (Paxton *et al*. 2000). Furthermore, covariant risk is more prevalent in the rural areas in developing countries, forcing members to default when their main economic occupation (usually agriculture) fails (Paxton *et al*. 2000). In addition, the rural economies were found to be less monetised than the urban areas, suggesting that in urban areas people understand the critical role played by access to credit.

In stage two: the domino effect, living in urban areas, group leader quality, loan cycle, other credit sources and peer pressure were found to influence group repayment. As in the first stage, the domino effect and living in rural areas had a negative and positive impact on repayment respectively. As expected, their study also showed that groups with high quality leadership had a better repayment performance. This is also expected since shrewd leadership can mitigate the domino effect problem in a group. In addition, a strong leader can develop a contingency plan for bailing out a group in case of a problem. This assertion is given credence by a study done by Al-Azzam *et al*. (2013) in Jordan. Their study found that groups which screen the activities of their leader had higher repayment performance than the ones which did not screen their leaders. Similarly, the "other loan" variable was found to have a positive and significant effect, an indication of creditworthiness rather than having repayment obligations spread too thin.

Wenner (1995) tested whether attributes embedded in group networks such as the managerial ability of the group leader and the method of selecting group members improved group creditworthiness. He categorised the data he obtained from a multistage cluster survey of

economic and institutional characteristics from 25 Costa Rican credit groups into three types: Groups with no loan delinquency, groups with internal delinquency and groups with external loan delinquency. Groups with no delinquency meant that all members within the group honoured their repayment on time. Groups with internal delinquency meant that one of the members had problems repaying credit but the group managed to pay the lender on time using another repayment mechanism. External delinquency meant that the entire group was in arrears. As a result, Wenner used a probit model to estimate individual delinquency, estimated as a dummy variable. In addition, a multinomial logit model was specified to consider the effect of various regressors on the composite state of delinquency, where the dependent variable took distinct numerical values.

The Estimates show that dummies representing the presence of formal screening and a written code have a significant effect in reducing loan delinquency at both levels of interest – between members of the group and between the group and the lender. This suggests that groups that used private information to evaluate and select their peers possessed a written code of regulations and therefore were expected to have a higher rate of repayment than groups that did not utilise these facilities. Wenner (1995:270) argued that the existence of a "written code can be seen as a formal device that sets a uniform minimum standard for membership selection" which can be used to induce self selection. Moreover, he further argued that a written constitution creates an image of seriousness.

The number of visits made to a group by a credit officer was found to be significant and positively related to group loan delinquency. According to Wenner (1995), this arose from the fact that credit officers tended to pay more visits to problematic groups than to less problematic groups. However, and contrary to expectations, the groups which were located in areas with good infrastructure showed a higher level of internal and external delinquency. This may have indicated that these groups might have had other alternative sources of credit. Two reasons underlie this finding. Firstly, non-repayment by a group usually led to them being denied subsequent credit. The availability of other credit sources reduced this burden since the group

could have shifted its business to another lender. Secondly, the servicing of many loans could be challenging and such a financial squeeze could lead to default on some loans.

Zeller (1998) used data on 146 groups, sampled from six micro lending programmes in four agricultural regions in Madagascar, to investigate the effect of intra-community, programme and group characteristics on group credit repayment. Using a Tobit Model, where the groups' rates of repayment (measured as a percentage of total successful repayment by members) as the dependent variable, he found a positive significant relationship between social cohesion of the group (measured by the number of social bonds that members share in a group) and repayment. This is consistent with the expected outcome, given that a cohesive group could "lend a hand" to a member who was unable to repay their share of the loan arising from unsuccessful project returns. In addition, failure to honour repayment by a member who had a strong bond arising from family, neighbourhood and business connections could have translated into significant disutility that manifested itself, not only in a loss of "reputation among friends and relatives but also in reduced access to the informal social security network" (Zeller 1998: 616).

As a group's size increased so did the default rate (Zeller 2006). The argument underlying this assertion arose from the fact that a large group is more likely to encounter free riding problems among a segment of their membership. Free rider problems may occur as a result of some aspects of group monitoring costs having a public good character. Possibilities of collusion among group members cannot be entirely ruled out either. This is because social sanctions cannot work to discourage members from defaulting, when a large section of membership defaults. However, Zeller found a positive relationship between the size of the group and credit repayment. This arose from the fact that the members that were interviewed were part of a maximum membership of ten, which avoided the problem associated with very large groups.

The 'savings' dummy variable was also found to be significant, indicating that groups which belonged to programmes with a saving mechanism displayed higher repayment rates than groups without a savings facility. This was because the positive effect of savings motivated members to uphold financial discipline (Zeller 2006). Savings encourages financial discipline as the person who saves regularly tends to develop a saving culture which reduces impulse spending (Zeller

2006). Consistent with Wenner's (1995) findings, Zeller found 'a group constitution and internal rules' dummy that significantly influenced repayment rates. This result was consistent since groups that had a working constitution tended to increase transparency in their operations which reduced intra-group frictions and coordination cost.

In a similar type of study, Wydick (1999) used data derived from 137 credit groups in Guatemala to test the relative importance of group borrowing performance on three different types of social cohesion: Peer monitoring, social ties and borrowing group pressure. The dependent variable is a dummy variable with value one, if the group has a good credit repayment record. Four different categories of independent variables were used to capture how peer monitoring influenced repayment schemes – The average distance in kilometres between members' businesses, two dummies to capture whether members knew the weekly sales values of other members and if members engaged in the same line of businesses. The study also utilised a number of dummies representing gender composition of the group, members' previous activities with each other and the number of years members knew each other before forming the group. This was used to estimate the strength of social ties in repayment. Dummy variables for group willingness to apply pressure to defaulting members and the difficulty of applying pressure and group membership were used as proxies to represent the influence of group pressure on credit repayment.

As expected, Wydick (1999) found evidence that efficient monitoring rather than social bonding between the members contributed to the success of the group in terms of credit repayment. Specifically, monitoring proxies on the average distance in kilometres between members' businesses and knowledge of their colleagues' businesses weekly turnover were found to significantly influence group credit repayment. The longer the distance between members' businesses, the weaker the level of effective monitoring. On the other hand, the greater the members' knowledge of their colleagues' weekly turnover, the more easily repayment difficulties were detected. Therefore it can be argued that problems detected early are easier to solve than problems detected at later stages. Group repayment rates were also found to be higher in urban groups than in rural areas, primarily through the simulation of intra-group insurance via an

intensive monitoring system. Wydick claimed that this phenomenon was a consequence of the need for members to remain in the group and maintain future access to credit, rather than incur the threat of social sanctions from the members.

Sharma and Zeller (2004) utilised data from four lending programmes in Bangladesh. Stratified data from 128 groups was used to evaluate their credit repayment performance with respect to a number of variables: Group size, loan size, number of relatives in a group, the group's gender composition and the number of loan cycles (the number of loans a group has borrowed from the lender). The dependent variable is the delinquency rate defined as a percentage of total loans in arrears at the date when the full loan is supposed to be repaid; dummies 0 and 1 represent total default and successful credit repayment respectively. Using a Tobit Model they found the size of the loan, the number of relatives in a group and credit rationing to be positive significant determinants of repayment.

The impact of credit size on repayment can be argued to arise from the lender's reliance on dynamic incentives, where more substantial loans are granted as the repayment cycle progresses. Given that lenders award subsequent loans to groups they rate as reliable re-payers, it follows that more substantial loans are awarded to more responsible groups. Contrary to expectations, Sharma and Zeller (2004) found the proportion of relatives in the group adversely affected group repayment. However, this phenomenon is expected given that relatives tend to form close relationships and interact in close quarters, making it difficult for members to sanction one another.

Karlan (2007) used data from the Foundation for International Community Assistance (FINCA), a group-based lending programme in Peru to investigate the effect of geographical and cultural concentration on group repayment. The primary analysis estimated the loan default rate (measured as a percentage of unpaid loan amounts on the due date) on savings and on a geographical and cultural dispersion index. The point of divergence between this study and other studies is that for FINCA-Peru, group formation mechanism involved the programme assigning individuals to groups in stark contrast to other FINCA based programmes which gives members the opportunities to self-select themselves and form groups based on their mutual understanding

and social knowledge. This unique formation process created groups with exogenous levels of initial social ties. Karlan found groups which consisted of members who lived in close proximity and who were more culturally similar in that they had a higher repayment index and saved more. This was because of their ability to increase monitoring and as such enforce repayment of loans.

Congruent to the theory that group lending with joint liability can have a countervailing effect on credit repayment rates, a survey of 3 000 self-help groups was conducted in 2006 in Andhra Pradesh, a state in India. The data was analysed by Shanjun *et al.* (2012), which supported Besley's and Coate's (1995) and Paxton *et al.* (2000) assertions of the existence of endogenous domino effects affecting group repayments. By conducting a structural analysis of endogenous peer effects in group lending programmes using a static game model with incomplete information, Shanjun *et al.* (2012) found a large and positive endogenous peer effect, *ceteris paribus,* on credit repayment. More specifically, they found that the probability of members making full payment when all group members honour their obligations was 12 points higher than in a scenario where none of the members repay their credit obligations.

5.2.5 *Conclusion*

The theoretical studies that were reviewed demonstrate how the existing local information (embedded in a close-knit society) mitigates information asymmetries and reduces operational costs. In particular, they demonstrated how joint liability contracts reduced adverse selection and moral hazard and overcame enforcement problems by setting up contracts which held all members of a group responsible for their peers' failures. But, models that succeed in theory had not succeeded everywhere in practice. The evidence that was put forward in empirical studies showed a mixture of results in terms of what worked and what did not work. For example, the empirical studies discussed tend to support the theoretical literature on the existence of both stabilising factors (factors that aid high credit repayment) and destabilising factors (factors that explain different credit repayment disparities). In particular, group homogeneity, size, and use of a savings mechanism and the group leader's gender are important in explaining group repayment disparities. Nevertheless, apart from the study done by Paxton *et al.* (2000), other studies (Wenner 1995; Zeller 1998; Wydick 1999 and Sharma and Zeller 2004) did not consider the group repayment process. By taking group repayment as an event rather than a process, they did

not capture the inherent group weaknesses such as domino effects that can only be identified if the repayment is treated as a process.

The literature suggested that group lending contracts cannot be standardised. Specific intra-society characteristics must be considered in setting up such contracts. The current study intended to contribute towards narrowing this gap by estimating the contributory influences of factors which aided group repayment.

5.3 Research Methodology

This section explains the method used in data collection. It also includes the description of the data, the model used and the justification of the variables included in the analysis.

5.3.1 *The Choice of Kenya Rural Enterprise Programme*

The study utilises data collected from micro credit groups of the Kenya Rural Enterprise Programme (K-REP) in Nairobi, Kenya, during the month of August 2006. Three reasons underlined the choice of the K-REP programme from the 29 registered programmes in Kenya at the time. First, K-REP had been in existence longer than other programmes; consequently, it possessed a large clientele composed of both relatively new and old groups, which formed an ideal combination for comparative purposes.

Second, as recorded in the literature, a major concern is how to control the influence of unobservable programme attributes that influence group repayments. For example, lender attributes like attitude, strictness and inefficiency can influence group performance (Zeller 1998), making comparison among groups from different programmes inefficient. Consequently, unless such an influence was controlled, it could be difficult to estimate the effects of pertinent group dynamics that contributed to successful loan repayments. Third, K-REP operated more group-based products (schemes) than any other programme in Kenya, an attribute ideal for inter-group comparison purposes.

Background information of K-REP

The K-REP was established in Nairobi in 1984 as an intermediary non-governmental organisation (NGO) providing credit and technical assistance to other NGOs. Its original task was to:

1. empower low-income people (who would otherwise find it extremely difficult to access loans from formal lenders);
2. help them contribute to development processes, and
3. improve their standard of living (K-REP 2000)[11].

Although K-REP initially started giving loans to credit constrained poor entrepreneurs via other NGOs, the mode of operation changed in 1990 when K-REP started to deliver credit directly to groups (K-REP 2000). In addition to Nairobi (where K-REP had many operating offices, namely: Kawagware − the headquarters − Kibera, Kenyatta Avenue, Moi Avenue, and Buruburu), this organisation had spread to twenty six other major urban centres in Kenya. K-REP also served both rural and urban clientele with the operating target for an area credit office being 1 800 members (K-REP 2000).

The initial objective of the founders of K-REP was to create a financially sustainable programme to cover its own operating costs and to meet the credit demand of a growing clientele. However, between 1991 and 1995, the programme received a total of KES 352 million in grants (K-REP 2000). Increasingly, K-REP took the approach that their interest rates had to increase to cover operating and financial costs. In 1999, it transformed its financial services operation into a bank that provided access to deposit funds in the areas it serves. The change was motivated by the recognition that the external support the programme received could not be sustained for ever (K-REP 2000).

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[11]   Section 5.3.1 borrows heavily from the K-REP Bank- Micro-Finance Officer Handbook of 2000. The Handbook illustrates the programmes operations which is the subject of this section.

Formation, structure and conducts of K-REP groups

The success of micro-finance lending in developing countries is also attributed to the lenders' innovativeness in coming up with mechanisms of motivating borrowers to repay their loans (Rai and Sjöström 2004). The mechanisms are incorporated in group formation, structure and conduct. This section discusses these aspects with reference to the K-REP programme. It is through analysing the various facets of group lending as practised by this programme that the background against which this study is carried out can be fully understood.

In 1990 - 2006, K-REP programme funded MSEs through a group-based system, where members accessed credit through joint liability repayment schemes. The loans were provided to entrepreneurs through three group-based schemes, Juhudi, Chikola and Katikati (K-REP 2000). The Juhudi loan system was based on a group-based lending methodology within a stratified type of organisation. The first stratum constituted small groups of between 4 and 8 individuals known as "*watano*" (a Swahili name denoting five people). Between 3 and 8 Watano groups were combined to form one bigger group (KIWA). It is through this bigger group that the loan disbursement to individual members was carried out. A Watano group formation started when an individual entrepreneur approached K-REP offices for credit. Once the credit officer was satisfied that the individual satisfied the programme guidelines – in terms of legality of business, age, location and income – the individual was required to identify 4 to 7 other micro-entrepreneurs who was known to him/her and who was willing to be co-guarantors to each other. After the induction meetings with the credit officer, the Watano group elects its own officials and formulates its rules and regulations for its internal operations. This applied also to the KIWA group, albeit in this case all members selected the officials. Group solidarity grew through regular group meetings presided over by programme credit officers.

In contrast to the Juhudi Scheme – where credit officers were instrumental in their formation – the Chikola Scheme targeted already established and ongoing groups, especially the groups for which savings mobilisation was part of their objectives. Ordinarily, those groups were formed through a screening process spearheaded by members themselves. People with some similar

backgrounds formed groups in which social connections, level of education, type of business and ethnicity helped to bond members together. More often than not, these groups were formed as a means of accessing credit. Groups could have also been formed for other purposes although their primary focus remained that of accessing credit to comply with the lending conditions imposed by lenders. In addition, these groups had to be registered with the relevant government agency (K-REP 2000).

In the process of formation and subsequent registration of Chikola groups, some prospective people were rejected while other people were encouraged by their peers to join because their business attributes were already well-established. Following group formation, group operations and a code of conduct were guided by a constitution that was accepted by all. The constitution defined the leadership roles and selection, purpose of the group, repayment mechanisms and the entry and exit of new and old members respectively. Loan security was provided by group savings and through members' co-guarantee mechanisms, where the strength of the loan recovery schemes relied in the cohesiveness of indigenous communities (K-REP 2000).

The third scheme – Katikati – was developed to cater for MSEs who had financial needs beyond the provision of the Juhudi and Watano groups. However, they had one major similarity with Juhudi scheme – the programme credit officers were also instrumental in their formation which had a membership of between 5 and 10 individuals. The security of the loans that were provided for under this scheme was offered by the group's members' savings which is rooted in the joint liability lending scheme (K-REP 2000).

After they were formed, all groups regardless of their categories, were required to open a bank account and commence depositing the members' savings. This requirement was mandatory. Apart from assisting the individual members to develop a solid future capital base, the lender also encouraged compulsory savings as a mechanism for providing partial collateral for the loans given. This was in consideration that the more the borrower saved, the less he/she was likely to default, since a default could lead to loss of the entire savings. Second, compulsory savings

cultivated a savings culture despite competing daily needs for funds, and third, it acted as an early warning device in respect of possible repayment default, since members who were likely to default, more often than not, started by defaulting on savings commitments (Armendáriz de Aghion and Morduch 2005).

Management of the groups was achieved through regular group meetings that varied according to the particular credit scheme. The Juhudi Scheme members were required to hold weekly meetings, whilst Chikola and Katikati groups were required to hold meetings on a weekly, fortnightly or monthly basis depending on the agreement with the credit officers. Ordinarily, the meetings were held for purposes of savings mobilisation, election of officials, checking on payment progress, training and sometimes to also assess the commitment levels of group members (K-REP 2000). According to Armendáriz de Aghion and Morduch (2005), one of the early signs of possible default is failure by a member to attend regular meetings.

If a member satisfies the group's requirements – based on savings and group meeting attendance – a Juhudi group could receive its first loans 8 weeks after formation. The loans were granted according to an arithmetic progression, where a member under this scheme was entitled to KES. 20 000 in the first round, KES. 40 000 in the second round and subsequent loans were granted at an incremental rate of 25%. Group members received subsequent loans after honouring their previous engagements. The incremental factor for subsequent loans was intended to raise the borrower's expectation and increase the disutility of defaulting (K-REP 2000).

Chikola loans were distributed sequentially, 10 weeks after initial introduction of the group. Under this scheme, members of the same group were granted credit at different times and only after their colleagues who had received earlier credit had repaid, or were judged good re-payers. The use of a sequential lending mechanism by K-REP was intended to guard against adverse selection and induce peer monitoring among the members, as well as to prevent possible collusion among the members (K-REP 2000).

The Katikati Scheme administered a higher aggregate value of secured loans than Juhudi and Chikola schemes. Apart from the normal co-guarantee mechanism and compulsory savings employed as collateral, group members were required to make a written repayment commitment before a commissioner of oaths. This agreement outlined the implication in case of default. Under this group category, each member was entitled to receive a minimum of KES. 100 000 as the first loan while subsequent loans were granted with an incremental factor of between 50 to 100%. The loans were also advanced sequentially. Though a group membership of 10 was regarded as ideal by the programme, the actual group number could vary depending on the credit officer's recommendation (K-REP 2000).

Since the group members' income propensity to consume was assumed to be high, and income was earned daily by micro-entrepreneurs, K-REP insisted on being paid in many regular instalments that varied between weekly to monthly. A frequent repayment interval was critical for preventing borrowers from accumulating substantial cash, which they might have been tempted to fritter away. Further, a problem detected early is easier to solve than a problem detected in later stages. Thus, K-REP also used regular credit repayments as a screening device for detecting possible delinquent borrowers. An early warning enabled the programme to develop strategies to counter the growth of the problem. Moreover, close interaction between the credit officers and the borrowers during regular credit repayment meetings enabled the officers to establish a personalised relationship with the borrowers which encouraged openness that may have reduced the risk of repayment default (K-REP 2000).

Operationally, K-REP defined default as two missed (weekly) loan instalments in Juhudi Scheme and one missed monthly instalment in Chikola and Katikati schemes. If a default was detected, K-REP utilised a variety of measures to recover the money and to prevent the domino credit default effect. If a member in a Juhudi group could not raise the full instalment, his/her Watano members formed the first line of guarantors. Consequently, the inability of the Watano group to raise the required instalment pushed the burden on to the bigger KIWA group. In cases where Watano or KIWA groups raised the instalment, the members were required to follow the defaulter and ensure that a refund was made before the next repayment date. If the problem persisted, the

credit officer issued a demand note first to the defaulting member, then to the Watano group or the entire group in the case of Chikola and Katikati schemes. The notice informed the members about the forfeiture of their savings to the programme and in extreme cases, the credit officer, jointly with members of the group, could attach the defaulter's pledged items. Local government representatives were used to enforce compliance where necessary (K-REP 2000).

As micro-finance becomes a popular mechanism for disbursement of business financing to MSEs; institutions continue to be innovative in their programme design and products to encourage operational success. K-REP combined various group dynamics and innovative programme designs to encourage high repayment rates across a wide spectrum of borrowers. Apart from the main attribute of group joint liability lending, K-REP transferred the burden of group formation to the borrowers which was a feature that reduced adverse selection. Again, group solidarity was cultivated through encouraging regular group meetings presided over by programme credit officers. The meetings were used to mobilise savings and to monitor punctuality of payments and early detection of a repayment problem. The K-REP approach of disbursing loans sequentially was intended to create different levels of loan default disutility among members and thereby reduce the likelihood of their *ex ante* collaboration. The sequential advancing of credit acted as a buffer against possible non-repayment by placing members in a varied cycle of credit needs. This was a design aspect intended to encourage members who were waiting to access credit, so that they would pressurise their counterparts (who were earlier recipients of credit in order for them to repay their loans) so that they, in turn, could qualify for loans.

5.3.2 *Sample design*

As mentioned earlier, the survey was conducted on all K-REP groups in Nairobi, albeit with the exception of newly formed groups which were yet to make their first repayment instalment. Although K-REP had a national coverage, Nairobi was purposively selected due to its cosmopolitan nature, involving people from diverse backgrounds and ethnicity. The income

composition of Nairobi is also diverse, reflecting an ideal population for comparison of different variables.

The purposive selection of Nairobi was an attempt to control for the homogeneity problem that arises when a population of similar characteristics is studied (Paxton *et al.* 2000). Paxton *et al.* (2000) for example, noted that the culturally diverse populations with numerous ethnic groups and traditions as experienced in developing countries limited the generalisation of results if the study area included the countryside. Consequently, this study could have produced non-generalisable results if it were based in areas where inherent unobservable factors (such as those caused by cultural factors pertaining to rural areas) were not controlled. Furthermore, the selection of a cosmopolitan set-up also reduced the influence of covariant risk (similar risk) that is prevalent in rural areas of developing countries. This is because the population that engages in similar economic activities is confronted by the same risks (Paxton *et al.* 2000)

The study took the entire month, August 2006, to complete - a month's field research period was adequate to capture the repayment cycles of various group categories. A group-level questionnaire was formulated and administered by the researcher and two assistants. Several considerations was undertaken to ensure the reliability of the questionnaire in collecting the data. First, theoretical and empirical literature provided the basis for inclusion of questions contained in the questionnaire. Specifically the research adopted (with substantial amendment to suit the study objectives) a questionnaire used by Paxton (1996) who did a study in a similar background in Burkina Faso. Secondly, the questionnaire was pre-tested with 10 randomly selected groups in Maua Town. Pre-testing in a different location from the study area was intended to prevent respondent fatigue which can arise when a respondent is required to answer the same set of questions twice (during pilot testing and the main study).

The study took the group as a 'single' entity, meaning that the researcher administered only one questionnaire to a group. The chairperson of the group answered the question and in his or her absence, the group's secretary took over. The non-response rate was insignificant as only 2 out of 155 groups failed to answer the questions. The high respondent rate could have been attributed to

the fact that the researcher was specifically granted authority to conduct the interviews from K-REP main office.

The questionnaire included questions on membership characteristics, group leadership, programme and group loan repayment enforcement. These questions were intended to capture group and lending characteristics that may have affected group repayment. Moreover, the questionnaire captured the actual performance of the group concerning credit repayment. In particular, the group lender was asked whether he/she was aware of any member who had difficulties in repaying his/her obligation (during their meetings) in the current and previous credit cycles. In addition, questions capturing the capability of the group to repay the lender if they had experienced an "internal" problem were also included. In total, 147 groups representing about 95% of the total population in Nairobi were interviewed (with the exception of newly formed groups).

5.3.3 *Data description*

The K-REP programme is one of the oldest group lending programmes in Kenya having commenced its operations in the low-income areas of Nairobi during year 1984 (K-REP 2000). The survey indicated that at the time of these results (2006), the oldest group was about twenty years old (see Table 8). This implies that to-date group lending as a mechanism of advancing credit to the poor started in Kenya about three decades ago.

Table 8:   *Descriptive Statistics for Survey Variables*

Variables	Description	Mean	Std deviation
age	Age of group since formation – in months	77.95	53.22
mem	Number of members of the group	24.27	9.42
active	Number. of founder members still active in the group	11.32	6.98
income	Average income of members (in KES)	37 413.00	28 130.00
avloan	Average members' current loan (in KES)	106 575.00	117 044.00
aveage	Average age of members in a group in years	37.55	6.18
homo	An index calculated from nine "yes" or "no" questions. For yes = 1, no = 0	0.32	0.60
leaderage	Age of group leaders in years	40.64	7.61
period	Period of association with the 'current' lender	72.79	49.78
loancycle	The number of times the group has borrowed from the "current" lender	6.20	4.29
Diffno	Members who had difficulties paying current loan	2.83	1.07
nodiffprev	No. of members who had difficulties paying previous loan	2.87	2.21
Interest	K-REP interest rate – in percentage	16%	

On average, the K-REP group membership was 24, with the average age ranging between 15 to 55 years, suggesting that people of diverse ages used the group mechanism to access credit. Additionally, the average income of members of the groups surveyed was KES. 37 413 and ranged from KES. 5 000 to as high as KES. 200 000. Similarly, the homogeneity index calculated from nine "yes" or "no" questions (Appendix 2) showed low group homogeneity of 0.322, which contradicts the hypothesis that people from the same background pool together at least in credit groups. This could be explained by the cosmopolitan nature of a city population. Equally, about 80% of the groups indicated that they were required to pay their first instalment at the end of the first week after receiving the loan. This implied that initial repayment by some group members came directly from the borrowed funds.

As shown in Table 9, of the 145 groups who answered the "*diffcurr*" question, 56% indicated that at least one member in their group had some difficulties meeting their repayment obligations. Among them, the highest percentage was from the groups managed by men. Likewise, there was

a positive relationship between *previous* and *current* loan repayment difficulties. Out of the 63% of the groups which reported having difficulties in repaying *previous* loans, 76% had difficulties paying their *current* loan. Moreover, most K-REP loans (about 90%) were granted sequentially and about 92% of group members reported that they had no other source of credit.

Table 9: *Cross Tabulation: Repayment difficulties vs. other variables (values in percent)*

		No. of groups	Gender of group leader		Mode of loan disbursement		Another loan		Collateral requirement		Difficulties - previous loan		Group reaction	
			Male	Female	Seq.	Sem.	Yes	No	Yes	No	Yes	No	Force	Others
Diff	Yes	81	52	22	70	8	71	8	70	1	65	12	69	4
loan	No	64	40	23	56	6	61	3	52	1	20	38	16	7

Key:

Diff: difficulties in repaying the loan

In addition, and contrary to the general belief that micro-financing does not require collateral, about 98% of the groups were required to offer some form of security in order to access credit. Apart from the group co-guarantee mechanism requirement, other types of collateral required mandatory saving and household assets of the members. This does not, however, seem to have had any impact on repayment. Similarly, all groups reported a willingness to use force to "encourage" to pay the loan. Of all the groups interviewed, about 89% reported having used at least one form of threat to make members comply with the group's repayment obligations. The aspects of group collateral requirements and the willingness to use force to force repayments is at odds with the assumption that group solidarity and group co-guarantee mechanisms, alone, drive higher repayments.

Another question of interest is whether a group reported *arrears* when at least one member had difficulties in honouring his/her obligation. It was found that, of the 71 groups that reported internal difficulties and who answered the "*arrears*" question, about 56% reported no arrears meaning that they managed to pay their monthly obligations in full. Moreover, the method of accessing credit seemed to be inconsequential in determining whether a group had arrears since most of the groups were granted loans sequentially.

Leadership of the group was measured using both the level of education and previous experience of leader members. Typically, as expected, the groups who had a large amount in arrears had less educated leaders. Furthermore, the groups led by members with previous leadership experience had lower levels of arrears than those without experience. This demonstrated that strong leadership was instrumental in encouraging repayment and formulation of provisional loan repayment in case of a member defaulting.

It is worth noting that the average income of members under the K-REP group lending programme was KES 38 000 per month. This suggests that, contrary to general belief, K-REP did not necessarily target the poorest segment of the society. In a country where, about 46% of the population was classified as poor (GOK 2007), an average income of KES 38 000 per month was quite high and beyond the reach of many. This is consistent with Morduch's (1999) argument that micro-finance programmes, generally, are drifting away from their original purpose which was to fund the poor who cannot otherwise access finance.

It is also notable that the average loan value advanced by K-REP (KES 107 000) was generally beyond the repayment capacity of many poor people. Moreover, micro lenders are assumed to lend at lower interest rates than other conventional lenders. However, K-REP charged a nominal 16% per annum on a flat rate basis. When put into perspective, this rate compared unfavourably with conventional commercial banks' rates, which in 2006, was at a maximum of about 18% per annum at a reducing rate (GOK 2007). This implies that K-REP offered credit at a high interest rate to supposedly, the "poor" entrepreneurs.

5.3.4 *The conceptual framework and model*

Based on the literature reviewed and K-REP programme design, group repayment was influenced by the exogenous characteristics of the group and programme. This research employs the framework of group lending which adopts the theoretical insights of Besley and Coate (1995). Besley and Coate's theoretical game model provides a flexible way of incorporating a wide range of variables that explained K-REP group loan repayments. The model takes into consideration both the stabilising and destabilising variables within the group that affects group loan repayment performance. Due to the model's flexibility, a modified version, as applied by Paxton *et al*. (2000) will form the theoretical foundation of the analysis.

The Conceptual Framework

According to the then K-REP programme operations, a group loan repayment was a process which involved two distinct stages. Foremost, individual members were not supposed to make their repayment directly to the lender. Group lending protocol required members to initially contribute to their joint group account or in a joint meeting (weekly/fortnightly) where thereafter the consolidated returns were paid to K-REP by the group leader or an appointed person. Loan arrears (default) was said to occur when a group failed to repay its monthly instalment in full before the agreed date (mostly at the end of each successive month). To capture this repayment process, this study developed a multi-stage framework that took on the structure of a two-stage decision tree (Diagram 1). Firstly, the individual may or may not had a problem in repaying the loan (in the group meetings or account). Second, if the repayment problem did present itself, the loan to K-REP may or may not have been paid in time depending on enforcement mechanisms employed by the group.

Diagram 1:   *K-REP Group Loan Repayment Model*

Did any member of the group have a problem repaying their share?

Yes   *No*

Did group dynamics lead to the
repayment of the loan?

Yes   *No*

Loan repaid in full   *Default*   *Loan repaid in full*
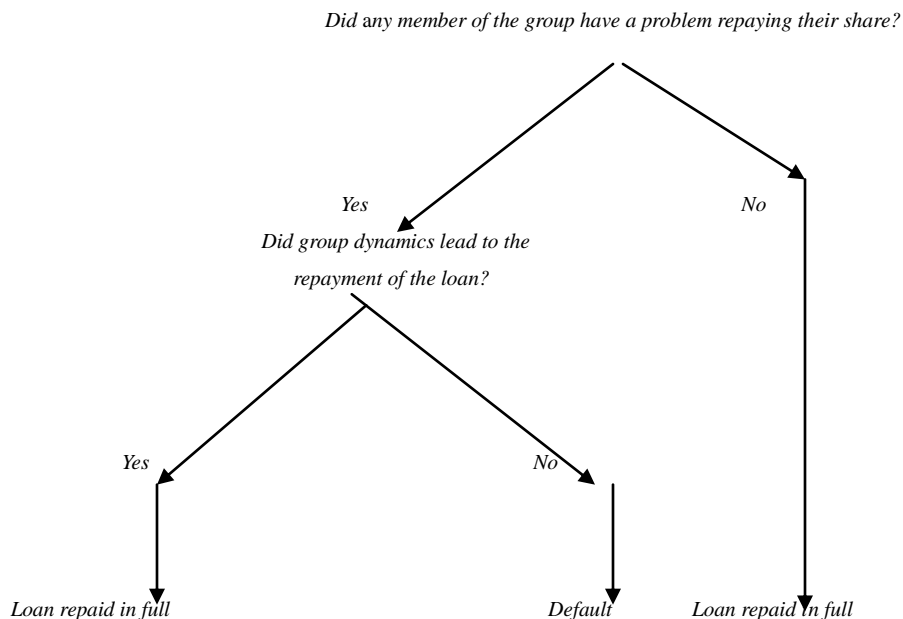
Several hypotheses derived from this model are tested. In stage one, the relationship between delinquency and explanatory variables is considered. At this stage, an individual member, may or

may not have a 'problem' in repaying his/her share of the group loan. The first task was to establish whether a member of the group had a problem in repaying their portion of the contribution. In a case where all members of the group reported no problems in repaying, then the group loan is assumed to have been repaid successfully. This stage targets the role of group characteristics in addressing adverse selection and monitoring problems, which is an obstacle for MSEs when accessing credit.

Stage two tests the relationship between arrears and explanatory variables. This stage examines the determinants of group repayment after at least one member had reported a 'problem'. This stage targets the factors that influence repayment enforcement after a group encountering some levels of delinquency.

The Model

This section presents a theoretical construct that represents group lending repayment processes. Based on the previous argument, repayment performance in a group-based lending programme was firstly determined by the process of group formation. The stage influenced the structure of the group which conditioned its performance, along with other exogenous attributes of the group and the programme. This study was not intended to model the influences of different stages that contributed to the initial group formation, rather it focused on investigating the role of intra-group characteristics 'in its current form", as well as the group's programme dynamics. The intra-group and programme variables were hypothesised to directly or indirectly influence the repayment rate.

Two types of models (Tobit and Probit) are commonly used to estimate determinants of group loan repayment performance. The Tobit Model, for example, is a special case of a censored regression model, which uses a latent dependant variable that cannot be observed and independent variables which can be observed. In particular, it assumes a latent (i.e. unobservable y^*) variable which linearly depends on the independent variable/s (or vector) x_i. The observable variable y_i is defined to be equal to the latent variable whenever the variable is above zero. In

addition, it assumes a normally distributed error term u_i to capture random influences in this relationship.

Examples of studies which adopted the Tobit Model are Zeller (1998) and Sharma and Zeller (2004). Their model incorporated the dependent variable as a continuous variable that is censored at a lower bound of zero and an upper bound of 100. The dependent variable is captured as a continuous variable based on the percentage number of members who manage to repay the loan on time. According to Zeller (1998) and Sharma and Zeller (2004), using a probit or multinomial model would have the effect of not capturing valuable information since the continuous dependent variable would then need to be transformed into a dummy variable. On the other hand, the use of an ordinary least squares model can lead to biased and inconsistent estimates (Greene 2002). If parameter β is estimated by regressing the observed y_i on x_i, the resulting OLS regression estimator is inconsistent and will yield a downwards-biased estimate of the slope coefficient and an upwards-biased estimate of the intercept (Greene 2002).

Apart from the model used, Wenner (1995), Zeller (1998) and Sharma and Zeller (2004) had earlier examined the significance of group attributes entrenched in group networks by categorising the group into three types: groups with no loan delinquency, groups with internal delinquency only and others with external loan delinquency. To them, internal delinquency meant the group with at least one member with a repayment problem but the group managed to pay the lender on time using another repayment mechanism. Moreover, external delinquency captured the situation where the entire group was in arrears. As a result, they utilised a Probit Model to estimate the individual delinquency, estimated as a dummy variable.

The current study adapts the approach used by Wenner (1995) to estimate the contributory factors of stage one i.e. to estimate the determinants of groups with no internal loan delinquency. However, this study used the Heckman Probit two-stage estimate of the significant factors of the second stage. Zeller (1998) and Sharma and Zeller (2004) treated the dependent variable as a continuous variable, thus rendering the use of the Probit model inefficient. The current study also departs from this assumption as its main thrust of investigation and instead takes a group as one

entity. This means that when one member defaults, all others are assumed to have defaulted and they have to repay the loan. This is consistent with the K-REP definition of default, which specified a good group to be the one which had paid in full. For this reason, specifying the dependent variable in binary form will provide efficient results.

The first equation therefore estimates whether a member had difficulties in repaying their dues to the group. The outcome is modelled as a dichotomous problem and computed using probit maximum likelihood estimation. The model takes the following structure:

$$Y_i^* = x_i\beta + \varepsilon_i \tag{5.14}$$

$$Y_i = \begin{cases} Y_i^* \\ 0 \end{cases} \quad \text{if} \quad \begin{array}{l} Y_i^* > 0 \\ Y_i^* \leq 0 \end{array} \tag{5.15}$$

$$Y_i^* = x_i\beta + \varepsilon_i \tag{5.16}$$

$$Y_i = \begin{cases} Y_i^* \\ 0 \end{cases} \quad \text{if} \quad \begin{array}{l} Y_{1i}^* > 0 \\ Y_{1i}^* \leq 0 \end{array} \tag{5.17}$$

Y_i^* is the latent dependent variable, Y_i is the observed dependent variable, x_i is the vector of the dependent variables, β is the vector of coefficient, and ε_i is the error term and $\varepsilon_i \sim N(0,\sigma)$.

The estimated equations therefore take the following form:

$diffcurr_{ij} = \eta_{i1} + \eta_{i2}\ homo + \eta_{i3}mem + \eta_{i4}\ period + \eta_{i5}\ leadage + \eta_{i6}\ logavloan + \eta_{iI}\ aveage + \eta_{i8}\ female + \eta_{i9}\ repayfr + \eta_{i10}\ logincome + \eta_{i11}\ prevdiff + \eta_{i12}\ collateral + \eta_{i13}\ similar + \mu_i$

$$\tag{5.18}$$

Variables justification and measurements

In this section, concepts and measurements underlying each variable are described. It explains how various latent variables are quantified to enable the application of econometric analysis. It should be remembered that this study utilises group-based and not the individual based variables. This is because the model is designed to test the group as a unit rather than the individual's behaviour within the group.

In the first stage, the *diffcurr* is the dependent variable measured in binary form. The individual problem variable assumes value *1* if the group leader knew of a member in their group who had experienced a problem in meeting their obligation during the "current" credit cycle, and *0* otherwise.

Typically, formal financial institutions lend to individuals based primarily on the observable characteristics of borrowers. Some common indicators lenders evaluated included: the level of income, assets, availability of other sources of credit and other debts. In group lending, K-REP based its decisions on similar characteristics. Nonetheless, they also considered other group characteristics such as the homogeneity of the group, number of members, age of the group, group leadership, and loan cycle among other observable characteristics. This, by implication, means that these variables are also important determinants of credit repayment. This study incorporates these facets in determining group repayment performance.

More specifically, group homogeneity (*homo*) is a factor that could have potentially influenced the rate of credit repayment of a group. Paxton *et al*. (2000) estimated this variable using a homogeneity index constructed from each group by asking a series of nine yes/no type of questions. Ethnicity, gender, income level, participation in similar economic activities and whether they lived in the same neighbourhood were used. This study utilised a similar format to capture the effect of homogeneity on loan repayment.

Equally, both the theoretical and empirical literature along with K-REP group loan design indicates that the size of the group (*mem*) will play an important role in determining the group's credit repayment success. It has been hypothesised that the size of the group has two countervailing effects (i.e. a cancelling effect). On one hand, a bigger group encourages economies of scale in group operations which eases the burden of repayment. Moreover, this encourages a lender to intensely monitor groups with substantial loan portfolio out of fear because they may default (Impavido 1998, Stiglitz 1990). On the other hand, bigger groups are more prone to problems associated with free riding and the domino effect. In addition, the premium a member attaches to being in a particular group decreases with the increase of members of the group. Olson (1982), using a mathematical model showed that if a member's perception of the possible benefit of the group diminishes, the smaller the effort he or she is

willing to contribute to the common success of the group. To capture this variable, this study used the number of members of the group who are actively participating in the loan repayment. The expected sign can take either a positive or a negative value.

In an ideal situation, one expects repayment to improve over time as the groups become more cohesive with improved understanding of the loan process (Wydick 1999). Increased knowledge of each other and development of ties as the group ages strengthen the ability of members to monitor each other and ensure loan repayment. Additionally, as the age of the group increases, members over a period of time progressively self-select themselves until the group retains the lowest risk members who, through subsequent credit, have been tested over time. In addition, members fear compromising the group's good name built over the years. Consequently, the number of months a group has been associated with the lender (*period*) is used to capture this influence. Wydick (1999) used the number of years since the borrowing group took its first group loan to capture the influence of the group association with the lender on group repayment.

In general, the quality of leadership is expected to influence the performance of an organisation. Group leaders organise meetings, motivates their group to pay and screen members when they want to join the group. Paxton *et al*. (2000), for example, captured this variable by asking the group members to rank their leader. However, since the respondents in this study were the group leaders themselves, requesting someone to evaluate herself/himself could have led to biased results. For this reason, leaders' age (*leadage*) is used to capture their quality of leadership. This is possible as in most African societies, advancement of age is equated with wisdom and also commands respect within a society.

Other factors that have been suggested that may significantly influence group loan repayment include the size of the loan, demographic characteristics, gender, and occurrence of idiosyncratic shocks. The value of the loan can have two countervailing effects on credit repayment (Sharma and Zeller 2004). It has been argued that large loans put more pressure on the businesses and, as such, it was expected that members with substantial loans faced a greater probability of experiencing difficulties in repaying credit. However, this does not always hold true. As previously stated (Section 5.3.2), subsequent loans were given to members who had

demonstrated their ability to repay earlier loans and that loan size tended to be bigger at each subsequent loan cycle. It could be therefore be argued that substantial loans were a product of an assortative process in which high risk members were not considered as possible loan recipients. To capture the effect of this variable, the average loan value received by members (*logavloan*) of a group is utilised. The expected sign can take any value.

It is also useful to evaluate the demographic effect of members in estimating the level of credit repayment difficulties. It is expected that, respect for social ties and respective importance of social capital increases with age. It is also postulated that the knowledge of the other members' characteristics and behaviour as well as the level of intra-group social ties are likely to be affected by the age composition of the group. For this reason, groups that had younger members were expected to experience more difficulties than groups composed of older members. To capture this influence in group repayment, this study used the average age of members in a group (*aveage*). Likewise, keen interest is also directed at explaining the role of gender in group credit repayment (Sharma and Zeller 2004) In this regard, a dummy variable (*female*) is included to capture the gender contribution in repayment.

Occurrence of idiosyncratic shocks, which cut across the entire group network, can greatly contribute to the differences in repayment delinquency (Paxton *et al*. 2000). Members who engage in the same line of business are expected to have a higher probability of experiencing related income shocks than members with diversified trade. This can translate into higher group repayment difficulties if an adverse shock hits their businesses missing words here than members who have diversified businesses. The dummy variable (*similar*) is used to capture the effect of this variable.

The K-REP programme design also used other innovative mechanism to complement the role of group dynamics in improving credit repayment. The mechanism included encouraging regular credit repayments which took place weekly, fortnightly or monthly. Theoretical and empirical reviews show that regular credit repayment increases prospects of full loan repayments. Bhole and Ogden (2010) attest to this by arguing that group lending repayments are superior to individual lending only when lenders develop a cross facet monitoring of borrowers which includes, but is not limited to, regular updates of the borrowers' statuses. This study adopts the

approach employed by Armendáriz and Morduch (2000) where the number of times (*repayfr*) the members are supposed to pay per year is used.

Other variables employed in the model include members' income, number of members who had previous difficulties in credit repayments and collateral requirements. The income variable (*logincome*) is included to capture the effect of member's income on credit repayment. It is expected that members with higher incomes are expected to be better credit re-payers than members with lower incomes. Higher income earners are expected to have adequate funds to take care of their basic requirements and have extra for repaying credit (Zeller 1994). Likewise, a group with a history of repayment difficulties is expected to have more current repayment difficulties - domino effect (Paxton 2000). Although the joint liability aspect in group leading is intended to assist a member in difficulties, it can have a domino effect in the subsequent loan repayments, since those members who had assisted others before can voluntarily default to earn assistance. To capture this effect, the number of members who had difficulties (*diffprev*) in the previous loan cycles is included.

Collateral plays a critical role in encouraging repayment because it acts as a guarantee against default (Schoombee 2000). Some K-REP groups are required to pledge household items (*collateral*) in addition to maintaining mandatory savings (K-REP 2000). As such, special interest is given to understanding the role of this requirement in credit repayment.

Heckman's probit two-step estimation

The second equation is a conditional outcome of the first equation. If a repayment problem exists (*diffcurr $_i$ > 0*), the loan may or may not be repaid. This stage therefore estimates the factors determining whether a member of a group who had earlier reported repayment difficulties had eventually paid the lender.

 The model can be expressed as:

$$Z^*_i = w_i \beta + \acute{\epsilon}_i \quad \text{observed only if } \textit{diffcurr}_i > 0. \qquad\qquad 5.19$$

Z^*_i is the group repayment variable which also takes a value of 1 or 0, depending on whether the group had paid their lender on time or not, if one or more members of the said group had experienced some difficulties. The vector w_i comprises variables that impacted on the group's repayment status, and $\acute{\varepsilon}_i$ is the error term and is assumed to follow a bivariate normal distribution with a mean of 0.

Estimating Equation 5.19 using the observed Z^* will produce biased results. This is because a substantial number of the groups interviewed had not experienced initial problems in repaying their loan (*diffcurr$_i$* * = 0). Running a regression without taking consideration of the missing information may lead to biased estimates of the effect of the independent variables on repayment. Heckman (1979: 153), for example, argues that the use of "non-random selected samples to estimate relationships as an ordinary specification bias that arises because of missing data problems" leads to a specification error. To deal with this sample selection bias, Equation 5.19 is estimated using a Heckman's Probit two-step estimation procedure. This procedure first involves estimating a Probit Model by maximum likelihood method. This regression is used to compute an estimator (inverse Mills ratio-lambda) based on the conditional expectation of the observed independent variable, which is used as an instrument in the second regression.

The empirical equation estimated therefore takes the following format:

$arrears_{ij} = \beta_{i1}$ *leaderexp* + β_{i2} *fmembers* + β_{i3} *age* + β_{i14} *diffno* + β_{i5} *mem* + β_{i6} *othercr* + β_{i7} *paysource* + *twostep select* (η_{i2} *homo* + η_{i3}*mem* + η_{i4} *period* + η_{i5} *leadage* + η_{i6} *logavloan* + η_{i1} *aveage* + η_{i8} *female* + η_{i9} *repayfr* + η_{i10} *logincome* + η_{i11} *prevdiff* + η_{i12} *collateral* + η_{i13} *similar*)   5.10

Variable justification and measurements
In the second stage, "*arrears*" is the dependent variable measured in binary form. The group problem variable assumes the value *1* if the group had experienced a problem in meeting one or more repayment obligations in the "current" credit cycle and *0* if otherwise. Independent variables include the group leader's previous leadership experience (*leaderexp*), founder members still in the group (*fmembers*), the age of the group in months (*age*) and members who

had difficulties paying current loan (*diffno*). Other variables incorporated are membership of the group (*mem*), whether the group had loans from other lenders (*otherc*) and sources of support from members who had difficulties in repayment (*paysource*).

As mentioned in the literature review (Section 5.3.1), the "domino effect" is a negative externality associated with group credit repayment. Shrewd leadership can mitigate the occurrence of a domino effect problem in a group (Paxton 2000). The ability of the group leader to prevent this occurrence is said to depend on his/her previous experience (Paxton 2000). An experienced leader can motivate other members to pay on behalf of a member who is unable to do so. In this regard, previous or other leadership experience is used to capture their quality of leadership. A dummy variable (*leaderexp*) is used to capture the group leader's previous experience.

The level of group solidarity can determine the willingness of the group to repay the contribution for a member who experiences difficulties in repaying their contribution (Besley and Coate 1995). It is expected that partners who had stayed in the same group for a longer period tended to develop common bonds and were more willing to assist each other in cases of difficulties (Besley and Coate 1995). Second, as common bonds strengthen, they tended to trust each other more. To capture this influence, the number of founder members (*fmembers*) who were still active in a group could determine the cohesiveness of that group and determine the willingness of other members to pay for their partners in need. This variable is important since group membership composition changes over time, implying that the longevity of the group alone cannot effectively capture this influence.

Micro-finance groups receive credit sequentially or simultaneously (K-REP 2000). The literature reviewed suggests that sequential lending is more likely to encourage intense monitoring than simultaneous lending and hence decreases default (Varian 1990). Although, this variable seems appropriate *apriori*, it cannot be included as most K-REP loans are accessed sequentially (K-REP 2000). A further consideration is that groups which can access credit from many sources are likely to have a lower level of disutility with respect to non-repayment than their counterparts without such opportunities. Similarly, groups with other sources of credit are expected to

experience heavier repayment demands which are expected to induce repayment difficulties. A credit dummy *otherc* is therefore included to capture this effect.

The number of members in a group who experience problems in "stage one" is more likely to impact negatively on the group's ability to repay the lender. It is easier for other group members to pay the share of their delinquent colleagues if there are not many of them. Consequently, this study uses the number of members (*diffno*) who had problems in the "current loan" cycle to capture this influence. This is congruent to Shanjua's *et al*. (2012) findings of a negative domino effect on the group credit repayment. Subsequently, groups that pay the dues of defaulting members from the pooled group savings may stand a better chance of repaying credit on time than groups that rely on other sources of finance. The rationale of this assertion is that ordinarily, it takes more time for members to react to the reality of default than when they just need to withdraw some funds from an already established account. A dummy variable *paysource* is included to capture these effects.

Age of the group is also included in the model as an independent variable as it is assumed that group "behaviour" matures with age through assortative process (Ghatak 2000). The assortative process over time induces members to trust each other that may encourage them to repay the loan obligations of defaulting fellow members. There is also a positive relationship between age and savings accumulation. More savings enable a group to mitigate against default (Zeller 1998). Variable *age* is included to capture the age of the group. A positive sign is expected. Moreover, the variable *mem* is also included to capture the effect of group size in repayment. It is argued that if a group is very big, certain of its features may take the nature of public good character (e.g. free riding), an aspect that reduces their ability to repay (Ghatak and Guinnane 1999). The membership number in a group is expected to be positively related to payment.

Another distinctive feature of the K-REP programme is the requirement that groups were to develop a savings base equivalent to about 10% of the money requested before their application is granted (K-REP 2000). It is assumed that members of a group who have accumulated a substantial amount of savings will find it easier to bail out a member in difficulty (Zeller 1998). This rationale is based on the expectation that, in case of total default, the members can recoup their money from the existing savings of the defaulting member. Furthermore, the importance of

saving increases members' discipline. This variable is also not included in the model since all members were required to save. The level of savings is related to the age of the group which is captured as a separate variable.

Lastly, twostep select (....) variables are as previously defined in Equation 5.18.

5.4 Data Analysis and Discussion of Results

The two-stage repayment model previously described in Section 5.3.4 requires a two-step estimation process. In the first step, a Univariate Probit Model is utilised to isolate the significant factors affecting a group's 'internal' repayment performance. In the second step, Heckman two-stage estimation is used to examine the determinants of a group loan repayment after at least one member had difficulties in honouring their share of repayment in stage one. To avoid model selection bias, mostly different variables are used in each stage. The study employs the STATA 8.2 statistical programme.

5.4.1 *Univariate estimation of the probability of finding a delinquent member in a group*

A large number of group and programme factors play a role in determining whether a group is experiencing problems repaying credit. Of twelve possible variables thought to be associated with the incidence of credit default (*diffcurr)*, two variables, *similar* and *collateral,* are dropped. This exclusion is justified as all groups engage in similar activities (business) and provide collateral before accessing credit. Table 10 reflects the univariate probit estimates in predicting *diffcurr*.

Table 10:   *Univariate probit model results in group lending: Dependent variable = diffcurr (individual credit default)*

Variable	Expected parameter sign	Parameter estimates and sign	Standard error
Constant		2.398	3.768
diffprev	+	1.464*	0.360
logincome	-	-0.172	0.338
repayfr	-	0.304	0.304
female	-	-0.654***	0.377
aveage	-	0.003	0.032
logavloan	±	-0.145	0.322
homo	-	-0.954	0.757
mem	±	-0.001	0.024
period	-	0.007***	0.004
leaderage	-	-0.006	0.028

Note: (*, **, ***) indicate significance at 1%, 5% and 10% level.

Table 10 indicate that some variables play a statistically significant role in group repayment schemes, and most of them fit *a priori* expectations. At the group level, the probability of a group having trouble decreases significantly with gender, and increases with group's previous difficulty status and the period the group has been in existence. The outcome of the gender variable (*female*) was significant and the result is as expected. This suggests that groups managed by women tended to do better than groups led by men.

Consistent with Besley and Coate's (1995) assertion, the relationship between previous group repayment difficulties (*prevdiff*) and current difficulties (*diffcurr*) is significant and also displays the expected result. This is as expected due to the domino effect associated with solidarity group lending. Domino effects as Shanjun *et al*. (2012) attests can introduce the 'revenge' tendencies

where members who had previously paid for their colleagues in the 'previous' loan cycles intentionally default in the 'current' cycle. This outcome also suggests that the assortative action expected to occur over credit cycles - where high-risk members are dropped from the group - does not necessarily happen. This possibility is explained by the decreasing power of social penalties (like expelling a delinquent member) when members develop social bonds over time.

Unexpectedly, the result of the relationship between the numbers of months (*period*) a group had associated with K-REP and the dependent variable (*diffcurr*) is positive. The result of the *period* variable should be negative given that longer serving members of the credit should know each other better and develop smoother working and social ties as the age of the group increases. Three possible reasons may explain this unexpected result. Firstly, most founder members were no longer active group members (the study found high membership turnover in many groups over the period of their existence) which effectively implies that membership is constantly evolving. This reduced the advantages associated with older groups. Second, as noted by Paxton *et al.* (2000), as the group age increased, loan size increased due to dynamic incentives. These incentives enabled individual members to be granted more substantial loan portfolios that may have led to repayment difficulties. Lastly, it should also be noted that the experience of "difficulty" in repayment was not synonymous with group repayment default (arrears). Members who had been working together for some time developed a common understanding and sense of leniency. This "informal" working of the group may have encouraged a certain laxity among members in terms of honouring their loan repayment obligations, although their fellow members might have bailed them out in time to avoid the group falling into arrears.

Other variables produced insignificant coefficients meaning their influence in determining the dependent variable was minimal. However, a brief explanation can shed more light on these outcomes. The coefficient of the income variable (*logincome*) for example, is negative and insignificant. Though its effect is insignificant, it does indicate that the higher the member's income, the less likely she is to encounter repayment problems. This is expected considering the higher interest rate K-REP charged for providing loans. At a 16% "flat rate", many start-up and struggling entrepreneurs with low-incomes could have found it difficult to cope with the required repayment.

As expected, this study found a negative, though insignificant, relationship between group homogeneity (*homo*) and prospect of finding a member with repayment difficulties in a group. As noted, K-REP schemes encouraged members to bond with their close associates (K-REP 2000). The ensuing social interactive process produced some groups with similar social, cultural, religious and business backgrounds (Paxton 2000). This intuitively enabled them to develop common bonds and form close-knit groups whose members strived hard not to disappoint their fellow members. Again, members with similar backgrounds had an information advantage that prevented accepting risky members into their groups. In addition, they easily monitored each other more effectively and at lower cost. This result is consistent with the study carried out by Paxton *et al*. (2000) in Burkina Faso.

Unexpectedly, the coefficient of repayment frequency *repayfr* is positive. This is surprising since it is hypothesised that regular credit repayment reduces default through encouraging group members to have more savings and repayment discipline. In addition, it enables the lenders to monitor and take remedial measures early in case of a problem. However, closer scrutiny of K-REP lending procedure explains this apparent anomaly. K-REP allowed credit groups in Katikati Scheme (the groups with a more secure loan portfolio) to pay with fewer instalments than other groups (Juhudi and Chikola, which were perceived to be more risky), resulting in higher repayment rates for lower repayment frequency groups.

Similarly, the study found the relationship between group size (*mem*) and repayment difficulties positive but insignificant. As Ghatak and Guinnane (1999) suggested, an increase in the size of a group can encourage free riding behaviour among a segment of the group. In addition group monitoring can adopt a public good character (Ghatak and Guinnane 1999). Likewise, groups operating in a city environment, like Nairobi can encounter considerable difficulties when applying social sanctions, since members of the group have weaker social ties than those in a rural environment. The countervailing effects of group size and urban versus rural location may account for the insignificance of this variable.

The group leader's age (*leadage*) has previously indicated as being negatively associated with the likelihood of credit default. However, the result is insignificant. This negative relationship is as expected given that, under K-REP programme, group leaders played a critical role in

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organising meetings, motivating group members to put more effort into their projects and screening new members who wanted to join the group. These abilities are expected to increase with experience - a derivative of age.

Additional variables exhibiting insignificant coefficients are the size of the loan and group membership age. This is partially expected, as a sizable loan is translated into burden of repayment. Moreover, the demographic effect (*aveage*) of members in estimating the level of credit repayment difficulties is insignificant, but the result is unexpected. It is predicted that groups composed of older members were more cohesive than groups formed by younger people – through the process of assortative action over the years. However, older members can be expected to find it more difficult to apply social sanctions against their peers compared to younger members.

5.4.2 *Heckman Probit Model for analysing a group's repayment difficulties*

The second thrust of this study investigates the determinants of a group that might have encountered a repayment problem after experiencing an "internal" problem. The findings of this analysis are presented in Table 11.

Table 11: *Heckman Probit estimation results for a group with difficulty in repayment: Dependent variable = Arrears*

	Variable	**Expected sign**	**Parameter estimates**	**Standard error**
Arrears	Constant		0.533	0.775
	leadexp	-	0.437	0.444
	fmembers	-	0.012	0.027
	diffno	+	0.330**	0.158
	age	-	-0.011**	0.004
	othercr	+	0.005	0.561
	mem	±	-0.013	0.020
	paysource	±	-0.241	0.366
Selection variables	Constant		-4.865	3.836
	Diffprev		1.747*	0.470
	Leadage		0.003	0.036
	Period		0.001	0.004
	Mem		-0.006	0.018
	Homo		-0.657	0.616
	Logavloan		0.180	0.206
	Aveage		-0.027	0.038
	female		-0.750***	0.437
	repayfr		0.299	.0303
	logincome		-0.689***	0.376

Note: *(*, **, ***) indicate significance at 1%, 5% and 10% level.*

The number of members which had repayment difficulties in a group is significant, albeit at 5% level and with the expected sign. This is expected as the level of difficulty experienced in bailing out members in financial problems was proportional to the number of members in need. Moreover, the effect of the applying social sanctions to enforce repayment decreases as the number of members in difficulty increases. Similarly, the age factor is significant at the 5% level, implying that as the age of the group increased, the group was able to overcome internal problems and repay credit without arrears. There may be several reasons for this phenomenon including the assortative process which ensured that 'risky' members were weeded out over time, leaving honest members who trusted each other to remain in the group. Moreover, with time, repayment improved as the groups became more cohesive and had an improved understanding of the loan process. In addition, improved knowledge of one another and expansion of social ties as the group aged enhanced the capacity of members to monitor each other and thus guarantee loan settlement.

Another variable worth noting, albeit insignificant was the impact of multiple credit sources on group repayment (*othercr*). Groups which had various sources of credit tended to fare more poorly in respect of credit repayment than their single credit source counterparts. Two reasons may have explained this scenario. First, members who had larger loan portfolios had heavier repayment obligations and so were not in a position to assist colleagues who experienced repayment difficulties. Second, programme dynamics employed to motivate groups to strive for good repayment records decreased with multiple sources of credit since groups denied credit from one source can access it from another lender.

5.5 Change of Lending Policy: was there justification?

The current section attempts to contextualise the change in the lending policy. In particular, the section intends to give an insight into a number of overlapping queries - whether the adopted mode of group lending mechanism had capacity to alleviate the lack credit access by MSEs in 1999 and whether there were some aspects which were overlooked during the change. To provide this contextual proposition, this section utilised the analysis presented in the previous chapters.

5.5.1 *Group lending and asymmetrical information*

To analyse whether the change of credit policy had support, the starting point is to detail the significant factors which caused MSEs not to access credit (as specified in Chapter Three and Four), from there the results can be extrapolated to whether group lending was capable of mitigating them (from Chapter Five). Chapter Three and Four show that MSEs had inherent characteristics which prohibited them from demanding credit and when they did they were credit rationed – an aspect which presents a "cyclical" type of behaviour between credit supply and demand. The thrust of this section therefore, evaluates whether the asymmetric information problem (adverse selection, moral hazard and enforcement problems) which caused this "cyclical" behaviour associated with MSEs in accessing credit in Kenya could have been mitigated by lending through group networks.

From the analysis contained in earlier sections of this chapter, group lending had inherent mechanisms to minimise adverse selection. In group lending, members self-selected themselves when forming groups, an aspect which transfers the burden of selection from lenders to borrowers (Morduch 1999). Given that about 87% of the MSEs in 1999 were not registered with relevant government agencies and 74% were operating in temporary structures, Means that the lenders had no mechanism of determining the riskiness of MSEs. This could have been overcome through group lending as all the groups involved in the credit market were registered by the Department of Culture and Social Affairs which was also charged with their supervision. This, therefore, enables a formal lender to access adequate historical information to determine the possible riskiness of their potential client/s.

In group lending mode, potential borrowers were required to operate an account with the lender (K-REP 2000). Moreover, lenders insisted on members of group saving a certain amount before being granted a loan. This requirement, apart from assisting the individual members to develop a solid future capital base, provided an opportunity for lenders to get to know the borrowers (Zeller 2006). It also provided partial collateral for loans advanced (K-REP 2000). In addition, the more the borrower saved; the less likely she/he was likely to default on repayment. The compulsory operation of an account and savings requirement therefore reduced the risk of adverse selection

and moral hazard for potential lenders which under individual lending was not applicable. This is important because many of the enterprises surveyed in 1999 did not operate an account.

The study's finding that micro entrepreneurs who were members of credit groups were more likely to secure loans (Chapter Three) is consistent with the same finding reported in the literature (Chapter Five). This result supports the suggestion that accessing loans through groups reduced adverse selection as members selected themselves into lower risk units. In addition, lending through the group mechanism reduced the transaction costs of administering individual loans and hence the rate of interest charged – a precursor for credit demand and supply.

Alongside the assortative matching process, group lending assisted in reducing adverse selection by determining the amount of loan each individual borrowed which was not the case in individual lending. Adverse selection was minimised since the group members were in a position to know the funding requirements of each member as well as her/his ability to repay any credit advanced. This greatly reduced the risk of some borrowers demanding more credit than they were able to utilise and repay– a precursor for low credit demand.

The requirement for groups to hold regular meeting was partially supposed to be for strategy and planning formulation, and to assist members with their needs and requirements and to help them in their understanding of projections (K-REP 2000). These meetings were partially intended to ease the problem associated with reallocation of resources in individual lending. Furthermore, the meetings were held to discuss member's performance, training and also to determine the commitment of members among other reasons (K-REP 2000). The aspect of training was intended to equip the members with computational and analytical skills required for the efficient and realistic reallocation of resources over time (Soman and Cheema 2002). This advantage is unavailable to MSEs when they demand credit in their individual capacity.

The analysis in Chapter Three also found that approximately 64.3% did not keep logs of their operations, implying that potential lenders had no means of gauging the credit worthiness of their operations. However, the 2006 survey of K-REP groups indicated that periodical group reports were presented (and it was mandatory) in group meetings to ascertain their performances.

Presentation of reports means that group network assisted in minimising monitoring cost associated with individual lending. Moreover, the aspect joint liability in group lending transferred part of monitoring cost to borrowers, hence making credit affordable.

 Apart from monitoring costs, lenders had to bear the enforcement cost. Due to weak credit repayment enforcement, lack of collateral by the borrowers and referencing services, lenders were generally cautious when they lent credit to individual MSEs. The 2006 K-REP group survey indicated that the element of joint liability (common in many group lending programmes) circumvented these problems by using the joint liability component to encourage members to enforce repayment by exerting peer pressure and using social sanctions on the defaulters. This effectively transferred a big segment of the enforcement cost from the lender to the borrowers.

In the analysis for credit demand, a common characteristic of micro borrowers was that they tended to have a high propensity to consume, and since their income was earned daily their time preference for money was very high. The 2006 survey indicated that lending through group as opposed to individual lending overcame this challenge as the lender insisted on many regular repayments that varied between weekly to monthly. Moreover, regular instalments served as an early warning of possible credit default problems that may have arisen at a later stage. This early warning system enabled group lending to develop strategies to counter these types of threats. Moreover, close interaction between the credit officers and the borrowers during regular credit repayment meetings enabled the officers to establish a personalised relationship with the borrowers which encouraged openness and eventually decreased the incidence of repayment default. Finally, as stated in Chapter Five, encouraging the sequential granting of credit guards against the risk of non-repayment experienced in individual lending. This fact invited peer monitoring and sanctions to ensure repayment and thus lowered the incidence of default, a feature which was not available in individual lending (Armendáriz de Aghion and Morduch 2000).

The comparison between individual lending and group lending indicated that group lending had some inherent dynamics which could have assisted in increasing access of credit to MSEs. This

suggested that the government decision to change was partially informed by theory – as previous theory and analysis (in this Chapter) attests. However, it is still inconclusive to vouch for it as a panacea for lack of credit access to these enterprises in the 1999 – 2006 decade. This is informed by the inherent weaknesses highlighted in the subsequent section.

5.5.2 *Individual to group lending policy: Factors overlooked*

The previous section provided that the Government decision was not entirely lacking in both theory and practice. However, despite making a number of significant contributions that for every theory and pragmatic evidence that supported the premise that group lending led to higher credit access, there seemed to have been a counter-argument. This section presented some aspects which might have been assumed when adopting group lending as a mechanism of alleviating lack of credit access to MSEs.

As the theory attest, intertemporal allocation of income is not easy and requires a reasonable competency in numeracy skills (Soman and Cheema 2002). The 1999 Baseline Survey indicated that most of the MSEs were operated by people of low educational standards – a precursor of low credit demand. From the previous section, it is argued that the weekly trainings undertaken in group lending assisted MSEs to reallocate income overtime. Furthermore, the group dynamic assisted in determining the needs of individual MSEs. Although this argument seems sound in theory, it finds little application in reality. In group lending, most groups are formed through an assortative process, where "birds of a feather flock together" . This implies that low educated people tend to associate with people who also did not have many years of education. Moreover, group meetings were more or less concerned with enforcement of repayment than anything else. It is on this basis that banking on group mechanism to assist MSEs to demand more credit was improbable.

Another hallmark underpinning group lending success is the element of peer pressure embedded in group solidarity. Group solidarity is bedded on social homogeneity where people who socialise in close circles, or are from a particular kinship, form groups which can be used to mitigate information asymmetries (Paxton 2000). However, Just like other developing countries,

Kenya is urbanising at a relatively high rate. High urbanisation is bringing with it unintended consequences, the ability of members to assort themselves and avoid adverse selection is eroded, close monitoring and enforcement of repayment also becomes difficult. This implies that what used to work in 1980s and 1990s cannot work in a rapidly urbanising environment where neighbours do not properly know each other.

On the other hand, the consequence of the "domino effect" was a main factor contributing to destabilising the functioning of the groups. The working of the group therefore cannot work if it is not backed up by other contract enforcing mechanism, including legal enforcements. Besides, the survey showed that all groups reported that they employed some levels of "bullying" to enforce repayment. Additionally, lenders went further to confiscate the defaulting member's property. This produced unpleasant experiences/or fear on the side of the borrowers which in effect can led to avoidance of loans through group network.

The success of group lending was partially based on the ability to make borrowers repay credit in regular short intervals – mostly on a weekly basis. Apart from the intended reasons, the design was more pro-lenders than pro-borrowers. It is true that group lending encouraged repayment, but the question is at what cost to MSEs? By insisting the loan be repaid almost immediately meant that the lenders were repaid partly with the money borrowed. Besides, the success in repayment was partly driven by borrowers being repaid from external streams of income and not necessarily from the financed project. This requirement can increase the financial distress to MSEs instead of addressing it.

Probably another mistake the Government did in trying to make MSEs access credit was by channelling credit through the established banks (YDF 2012). The theory (Chapter Three) attested that formal setting in those institutions were highly intimidating and beyond the comprehension of uneducated poor entrepreneurs. This aspect causes MSEs to not apply for credit. Lastly, the state of Kenya is composed of 42 different ethnic communities, these groups have diverse ways on how they socialise, communicate, meet and how they enforce informal contracts. The irony of the Government initiative was that they used the same standard format

across the board without considering that what works in one ethnic community cannot work in another.

It is therefore implausibly farfetched to suggest that group dynamics alone did mitigate problems associated with information asymmetry without other supportive innovations developed by the lending programmes themselves. It is therefore important to suggest that the role played by those innovations in driving repayments may as well be largely responsible for group lending success. Therefore, the correctness of the government decision cannot be ascertained without considering all the other facets included in micro lending programmes. It was therefore not prudent for the Government to "wholesomely" have adopted this mode of lending without addressing the inherent weaknesses associated with it.

CHAPTER SIX

CONCLUSION, RECOMMENDATIONS AND LIMITATIONS

6.1 Conclusion

In 2006, the Kenyan government-supported MSE lending programmes changed their lending policy from individual lending to group lending. However, this transformation was done devoid of an inclusive theoretical and empirical examination into understanding the underlying reasons why MSEs failed to access credit using individual lending (GOK 2005). The overall aim of this research is to provide an investigation into whether the transformation of this lending policy was backed by any theoretical and empirical support. To achieve this objective, this study provides the contextual analysis of the change. Specifically, what might have influenced the change, what informed it and what was over-looked.

The study establishes that MSEs failed to access credit due to various impediments prevalent in the credit market in Kenya. In the first instance, most of the MSEs did not demand credit. Two theories underpin this state of affairs. The first theory, credit rationing posits that the borrower's perceptions of success in being granted credit would determine the odds of their applying for credit. This suggested that demand was a function of the credit supplied - implying lack of supply created a lack of demand. Therefore, the factors that promoted an enterprise's credit worthiness generated a greater demand for credit. The second theory- the inter-termporal allocation of income speculates that MSEs' inter-temporal allocation of income was not easy; the implication was that enterprises did not demand credit against future income. The study finds that demand for credit by MSEs can be enhanced by promoting an enterprise's credit worthiness (by whether the enterprise's owner had a previous association with the lender and being in a savings and credit group) and by improving their literacy and analytical characteristics (education).

Second, when MSEs apply for credit they were credit rationed. Credit rationing stemmed from asymmetric information, and incentive and contract enforcement problems prevalent in credit markets of developing countries. Since credit lenders are generally risk averse and given that

they could not differentiate the riskiness of each loan applicant, they used other MSEs' observable characteristics to gauge their probability of credit repayments. This implies that some MSEs got credit while others were rationed. To minimise this problem, policy instruments geared towards streamlining and enhancing contractual enforcement mechanisms, improvement of enterprises' creditworthiness and increasing and expanding credit supply systems across the country needed to be encouraged. Consequently, to appreciate the appropriateness of the policy change entails investigating whether group lending could have alleviated institutional impediments associated with MSEs' lack of credit demand and thus resolve the subsequent problem of credit rationing. A further critical factor is whether group lending mitigates against information asymmetry and improves credit worthiness and analytical aspects of borrowers.

The analysis indicates that group lending had inherent mechanisms to minimise adverse selection, moral hazard and enforcement problems associated with information asymmetry. However, the analysis also show that the adoption of group lending could not/cannot solve the lack of credit access on its own without additional supporting mechanism in Kenya. It is correct to imply that group lending largely mitigated information asymmetry; however, asymmetric information was not the only source of credit failure in Kenya. For group lending to work or to have worked it required support by other pro-MSE programme dynamics. In comparison to the above analysis with what the government programmes adopted, it can be concluded that the government programmes fell short of embracing innovative dynamics to fit the Kenyan problem and as such, it was premature at the time to conclude that the policy was effective.

6.2 Recommendations

For the Government to have effectively achieved its intended purpose of liberating MSEs from lack of credit access, this finding suggests that groups are required to be properly constituted and supported by innovative programme designs. If this is not done, then credit markets may end up worse off than if other types of contracts are used, as there were some destabilising factors which affected group repayment.

From the above analysis, this thesis makes the following recommendations, the Government should:

i. Initiate specific programmes which take cognisance of the dynamics of each county (ethnic community) when designed. This is because the current Kenyan constitution created 47 county governments. These decentralized structures are largely demarcated along ethnic communities.

ii. Improve the legal system in Kenya. Improvement of legal system will reduce the consequence of "domino effect" which was a main factor contributing to destabilising the functioning of the groups. Domino effects can be mitigated in the environment where legal systems work efficiently to enforce repayment in case of failure of formal or informal contracts. Moreover, in the recent past (since 2009), with the advent of M-Pesa (mobile money transfer in Kenya), many people who could not access banking services can now access such services. This innovation should be encouraged and appropriate legal mechanism be formulated to support it and use it as a base of lending.

iii. Adopt long run strategy of extending basic education to include secondary education - to enable most people coming out of school to have the prerequisite analytical and computational skills. This is because low level of numeracy skills among MSEs operators was a main cause of credit market failure (Soman and Cheema 2002).

iv. Formulate pro-MSE (and not pro-lenders) programmes to support the inherent strengths of group lending. Group dynamics is assumed to lead to higher repayments; however, they cannot support higher repayment in isolation.

v. Conduct further research to ascertain the post policy efficacy of group lending mechanism. This will evaluate whether the change of lending policy achieved was what it intended to achieve.

6.3 Limitations

However, the results of this thesis should be examined within the context of the following limitations which future studies should consider addressing. First, the approach adopted assumes that borrowers were risk neutral; suggesting the view that it was the lender's decision which influenced both demand and access to credit. Nevertheless, potential borrowers sometimes did not apply for credit because of the fear of losing their collateral since there were no insurance markets available for them to mitigate risk. Boucher (2002: 6), for example, argues that

borrowers not only considered the cost across contracts – informal and formal - but also how the terms of the contracts affected the "smoothness of income across states".

Second, as indicated earlier, the research uses a national baseline survey which was compiled in 1999 and K-REP groups. A considerable limitation that confronts research of this nature is the biased selection of the sample. These surveys take into consideration only the businesses entities or credit groups which existed at that point in time (cross-sectional data). This is a limitation because it does not take into consideration entities that were liquidated before the research was undertaken, meaning that the information obtained from such types of research represents the opinion of a subset of the entire population.

Third, a common problem facing studies of this type is a lack of reliable data on small businesses (Chunchi and Young 2002). Most micro entrepreneurs did not keep records of their transactions as they tended to rely on memory (which is subject to memory decay). Furthermore, MSEs and credit groups did not enter into contracts that were publicly visible (Cook 2001). The group mechanism is based on the application of incomplete contracts theory where seemingly identical outcomes are judged and treated differently by members. This meant that trying to clearly understand and model all the possible group repayment outcomes was difficult.

Fourth, the success of group lending was attributed to joint liability lending and supporting lending mechanisms employed by the lenders. Consequently, the success repayment of credit by groups cannot be simply credited to group and programme dynamics alone since attitudes and strictness on the part of the credit officers may have compromised repayments in some programmes (Zeller 1998). In this regard, the major limitations experienced by studies of this nature centred on controlling the unobservable influences of different lenders on credit repayments. This is because intrinsic programme weaknesses can translate into inefficiencies that led to a poor repayment performance by groups who apparently have excellent credentials. Credit repayment performance is difficult to analyse unless the study is done in a controlled environment.

Lastly, as noted by Paxton *et al.* (2000), when generalising the results of these studies, a problem might arise when considering group repayments. Developing countries have culturally diverse

populations with numerous ethnic groups and traditions (Paxton *et al*. 2000). These traditions govern the relationship between individuals, including debt repayment (Paxton *et al*. 2000). These diversities in countries like Kenya often limit the ability to generalise as seen from the results of this study. Ideally, a study done in an environment in which cultural influences are minimal may better succeed in isolating the group characteristics that aid credit repayment.

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Appendices

Appendix 1: Group lending repayment performance questionnaire

Name of interviewer:

Date of interview:

Name of group (Optional):

Location:

Group Characteristics

a) How old is your group since formation (months)………………………………………………………………………

b) During group formation, how many members were in your group?………………………………

c) Out of these members, how many are currently having loans borrowed through the group? ………………

d) How many members have dropped out since formation? ……………………………………………………

e) What is the average income of the members per month?

☐   0 - 10,000

☐   10,001 – 20,000

☐   20,001 – 30,000

☐   30,001 – 40,000

☐   Others (specify):………………………..

f) What is the average age of the group members

☐   18 – 20

☐   21 – 30

☐ 32 – 40

☐ 41 – 50

☐ 51 – 60

☐ 60 – 70

☐ Others, specify

g) What is the main occupation of the members?

☐ Business

☐ Agriculture

☐ Formal employment

☐ Other, (specify) ……………………………………………………….

Group Homogeneity

h) For the following questions respond with yes, no or don't know.

(i) The members of the group belong to the same ethnic group
……………………………………….

(ii) The members of the group live in the same quarter
……………………………………………….

(iii) The members of the group are roughly the same age
…………………………………………………..

(iv) The members of the group are of the same sex
…………………………………………………………

(v) The members of the group engage in the same types of occupations throughout the year
……………....

(vi) The members of the group have roughly the same level of wealth
……………………………………

(vii)   The members of the group belong to the same denomination

   …………………………………..

(viii)   The members- all belong to another group in the village, town, occupational group, youth group, and e.t.c .………………………………………………………………..

(ix)   Does the group meet for any other reasons other than for loan servicing?

   …………………………

Group leadership

i)   How and why did you choose the group leader (Chairman)?

1. Sex

   ☐   Male

   ☐   Female

2. Level of education

   ☐   Primary education

   ☐   Secondary education

   ☐   College education

   ☐   University education

2. Age

   ☐   18 – 20 years

   ☐   21 – 30 years

   ☐   31 – 40 years

   ☐   41 – 50 years

   ☐   51 – 60 years

   ☐   61 – 70 years

3. Have you ever held any other leadership position in the society?

Source of credit

a) Name of micro-finance institution where your group is currently borrowing:

----

b) What is the average current amount borrowed by the members? (KES)

- ☐ 0 – 20,000

- ☐ 20,000 – 40,000

- ☐ 40,000 – 60,000

- ☐ 60,000 – 80,000

- ☐ 80,000 – 100,000

- ☐ Above 100,000, specify …………………………………

b) Previous amount borrowed (average per member (1) ………………………………………. (2) ……………………… (3) ………………………………… (4) …………………………………..

c) Current interest rate charged: …………………………………………………………

d) Previous interest rate charged (1) …………………………………….. (2) ……………………… (3) ………………………………. (4)…………………………………..

e) How long (in years) has your group been borrowing with the current microfinance institution? ………………………………………………………………

f) How many times has your group had a loan from the institution? ………………………………….

g) How long does it take between application and disbursement of loan …………………………….

h) What is the current mode of loan repayment? E.g. is it on a weekly basis, after two weeks, monthly, quarterly, half yearly or yearly?…………………………………………………………..

i) Is your group loan given sequentially or simultaneously? Do all members of the group get loans at the same time or some get earlier than others?……………………………………………………

j) If a member who gets a loan earlier than others fails to honour his/her obligation (repayment), does   his/her action affect the chances of the remaining members to get the loan (Yes /No) ………………………………………..

k) Is there any time that the current microfinance institution ever complained about the delay in repayment (Yes / No) ……………………..

l) If yes in l above, did it affect the next loan cycle (Yes/No) ………………………………………………..

m) If yes, in l above, in what way? (loan denied / amount reduced / loan disbursement delayed) ……………………

n) What is the mode of collateral (requirements) for your loans? …………………………………………

o) Does your group receive credit from any other source? (Yes / No) ………………………………..

Group Loan Repayment

(i) During the repayment cycles of the current loan, has any member of your group had difficulties in paying monthly obligation in total

   ☐ Yes

   ☐ No

   ☐ Don't know

(ii) During the repayment cycles of the previous loan, has any member of your group had difficulties in repaying his / her monthly share of loan repayment (four consecutive weeks)?

   ☐ Yes

   ☐ No

   ☐ Don't know

(iii) If the answer in (i) is yes, did the group manage to pay the lender?

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☐ Yes

☐ No

(iv) If the answer in (ii) is yes, did the group manage to pay the lender?

☐ Yes

☐ No

Group Homogeneity Computation

i) For the following questions respond with yes, no or don't know.

a. The members belong to the same ethnic group (y/n)

b. The members live in the same quarter   (y/n)

c. The members are roughly the same age (y/n)

d. The members are of the same sex (y/n)

e. The members engage in the same types of occupations throughout the year (y/n)

f. The members have roughly the same level of wealth (y/n)

g. The members belong to the same denomination (y/n).

h. The members all belong to another group in the village, town, occupational group, youth group, and e.t.c (y/n)

i. Does the group meet for any other reasons other than for loan servicing? (y/n)

Dummy variable is used to capture the respective outcomes (answers). Unweighted average is used to compute the arithmetic mean.

Appendix 2:   Probit estimates for demand for credit

Log likelihood = -347.63938

Probit estimates

Number of obs   =   1541

LR chi2(11)   =   66.26

Prob > chi2   =   0.0000

Pseudo R2   =   0.0870

cr_demand	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
LogEduc	.4131455	.2433333	1.70	0.090	-.063779	.8900699
strata	.1790703	.1453139	1.23	0.218	-.1057396	.4638802
Registration	-.0628452	.1581775	-0.40	0.691	-.3728674	.2471771
Bus_type	-.1654315	.2097357	-0.79	0.430	-.5765059	.2456429
Accounts	.5482634	.115656	4.74	0.000	.3215819	.7749449
Reconds	.0811995	.1169514	0.69	0.487	-.148021	31042
membership	.348959	.1113737	3.13	0.002	.1306705	.5672475
Log_Income	.0142051	.0440525	0.32	0.747	-.0721362	.1005463
tenure	.1514051	.1416796	1.07	0.285	-.1262819	.429092
Struct	.1774892	.1220744	1.45	0.146	-.0617722	.4167505
Resp_Gender	.0147745	.1110646	0.13	0.894	-.2029082	.2324571
cons	-3.123516	.6257118	-4.99	0.000	-4.349888	-1.897143

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Appendix 3:   Heckman selection model estimation for the amount of credit Demanded

Heckman selection model -- two-step estimates

(Regression model with sample selection)

Number of obs   =   1324

Censored obs   =   1280

Uncensored obs   =   44

Wald chi2(10)   =   43.78

Prob > chi2   =   0.0000

	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
logApplied						
Hhsize	.2103819	.0582269	3.61	0.000	.0962593	.3245046
Log_Rev	.3033927	.1216027	2.49	0.013	.0650558	.5417296
Membership	-.4978253	.3835604	-1.30	0.194	-1.24959	.2539394
Licence	.472684	.3591524	1.32	0.188	-.2312417	1.17661
Tarmac	-.0195757	.264738	-0.07	0.941	-.5384526	.4993012
logBusAge	-.7794728	2.030299	-0.38	0.701	-4.758786	3.19984
Employees	-1.613849	.6207408	-2.60	0.009	-2.830479	-.3972196
LogEduc	.9755517	.7851847	1.24	0.214	-.5633821	2.514486
cons	11.31353	8.960261	1.26	0.207	-6.248261	28.87531
cr_demand						
Struct	.1770279	.1660511	1.07	0.286	-.1484264	.5024821
Tenure	.1233209	.1991754	0.62	0.536	-.2670558	.5136976

Log_Income	.0984358	.0648916	1.52	0.129	-.0287494	.2256209
Reconds	-.0237552	.1619105	-0.15	0.883	-.3410939	.2935835
Accounts	.5972926	.1594016	3.75	0.000	.2848713	.909714
Own_Gender	-.2328826	.1563541	-1.49	0.136	-.5393309	.0735657
Bus_type	-5.344744	.	.	.	.	.
Registration	.0295095	.2087919	0.14	0.888	-.3797152	.4387342
Strata	.1040033	.2005435	0.52	0.604	-.2890547	.4970614
LogEduc	.014436	.2986134	0.05	0.961	-.5708356	.5997076
Membership	.2958585	.1570234	1.88	0.060	-.0119018	.6036187
Cons	-3.04542	.8251832	-3.69	0.000	-4.662749	-1.428091
mills						
lambda	-1.855892	.5698778	-3.26	0.001	-2.972832	-.7389519
rho	-1.00000					
sigma	1.855892					
lambda	-1.855892	.5698778				

Appendix 4: univeriate Probit estimates for credit supplied

Probit estimates

Number of obs = 1542

LR chi2(11) = 45.51

Prob > chi2 = 0.0000

Log likelihood = -259.04421

Pseudo R2 = 0.0807

CRss	Coef.	Std. Err .	z	P>|z|	[95% Conf. Interval]	
LogEduc	.122995	.2525955	0.49	0.626	-.372083	.6180731
strata	.2410659	.1709663	1.41	0.159	-.0940218	.5761537
Registration	-.1364065	.1864612	-0.73	0.464	-.5018636	.2290507
Bus_type	.0526915	.2247749	0.23	0.815	-.3878592	.4932422
Accounts	.6050317	.1306732	4.63	0.000	.3489169	.8611465
Reconds	-.07736	.1362993	-0.57	0.570	-.3445017	.1897817
Membership	.2877253	.1252063	2.30	0.022	.0423255	.5331251
Log_Income	-.0087811	.0503671	-0.17	0.862	-.1074987	.0899366
tenure	.1007	.1639713	0.61	0.539	-.2206777	.4220778
Struct	.2837142	.1377212	2.06	0.039	.0137856	.5536429
Resp_Gender	.2433405	.1275705	1.91	0.056	-.0066931	.4933741
Cons	-2.6133	.6808508	-3.84	0.000	-3.947743	-1.278857

Appendix 5:   Bivariate probit regression model for credit demand and supply

Bivariate probit regression   Number of obs   =   1541

                                                Wald chi2(22)   =   77.78

Log likelihood = -480.47168   Prob > chi2   =   0.0000

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
CRss						
LogEduc	.0840411	.2441778	0.34	0.731	-.3945387	.5626208
Strata	.2186878	.1662115	1.32	0.188	-.1070808	.5444563
Registration	-.0786002	.1796906	-0.44	0.662	-.4307873	.273587
Bus_type	.0839146	.2131463	0.39	0.694	-.3338445	.5016737
Accounts	.5706025	.1277318	4.47	0.000	.3202527	.8209523
Reconds	-.0719617	.1338268	-0.54	0.591	-.3342574	.190334
membership	.2092611	.12424	1.68	0.092	-.0342449	.4527671
Log_Income	.010884	.0478181	0.23	0.820	-.0828379	.1046058
Tenure	.0717622	.1619953	0.44	0.658	-.2457428	.3892672
Struct	.2585576	.1346483	1.92	0.055	-.0053482	.5224634
Resp_Gender	.2544553	.1227885	2.07	0.038	.0137943	.4951164
cons	-2.628802	.6543138	-4.02	0.000	-3.911233	-1.346371
cr_demand						
LogEduc	.4244528	.2380057	1.78	0.075	-.0420297	.8909354
strata	.1880377	.1462323	1.29	0.198	-.0985723	.4746477

Registration	-.0583056	.1563499	-0.37	0.709	-.3647457	.2481346
Bus_type	-.1324628	.2028556	-0.65	0.514	-.5300525	.2651269
Accounts	.5394929	.1146385	4.71	0.000	.3148056	.7641802
Reconds	.0829085	.1163281	0.71	0.476	-.1450904	.3109074
membership	.3301514	.1110304	2.97	0.003	.1125358	.5477671
Log_Income	.0228564	.0434489	0.53	0.599	-.0623019	.1080147
tenure	.1379937	.1424863	0.97	0.333	-.1412744	.4172618
Struct	.1697396	.1212625	1.40	0.162	-.0679305	.4074097
Resp_Gender	.030725	.1097548	0.28	0.780	-.1843905	.2458406
cons	-3.222581	.6189128	-5.21	0.000	-4.435628	-2.009534
athrho	1.702807	.1565461	10.88	0.000	1.395983	2.009632
rho	.9357591	.0194673			.8844802	.9647018

Likelihood-ratio test of rho =   0:   chi2(1) = 252.246   Prob > chi2 = 0.0000

Appendix 6:   Univariate probit model results for group lending

Probit estimates

				Number of obs		91
				LR chi^2 (10)		36.05
				Prob > chi^2		0.0001
Log likelihood = -43.453767				Pseudo R^2		0.2932

diffcurr	Coef.	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
diffprev	1.464092	.3603971	4.06	0.000	.7577264	2.170457
repayfr	.3357117	.3039294	1.10	0.269	-.259979	.9314025
female	-.6539198	.3770004	-1.73	0.083	-1.392827	.0849874
aveage	.0032362	.0320123	0.10	0.919	-.0595067	.0659791
logavloan	-.1452316	.3222849	-0.45	0.652	-.7768983	.4864352
homo	-.9535699	.7572529	-1.26	0.208	-2.437758	.5306186
leadage	-.0064716	.0275298	-0.24	0.814	-.0604291	.0474859
period	.0073276	.0037596	1.95	0.051	-.0000411	.0146964
mem	-.0002714	.0242921	-0.01	0.991	-.0478831	.0473403
logincome	-.1720265	.3377561	-0.51	0.611	-.8340163	.4899632
cons	2.398268	3.768026	0.64	0.524	-4.986926	9.783463

Appendix 7:   Heckman model estimation results for a group with difficulty in repayments

Probit model with sample selection

Number of obs   =   67

Censored obs   =   37

Uncensored obs   =   30

Wald chi2(7)   = 23791.68

Log likelihood = -46.81862

Prob > chi2   =   0.0000

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
arrears						
leaderexp	.4372657	.4442835	0.98	0.325	-.4335139	1.308045
fmembers	.0119247	.0272123	0.44	0.661	-.0414104	0652597
diffno	.3298719	.1577355	2.09	0.037	.0207159	.6390278
age	-.0105779	.0043069	-2.46	0.014	-.0190194	-.0021365
othercr	.0049089	.5615087	0.01	0.993	-1.095628	1.105446
mem	-.0128063	.0200599	-0.64	0.523	-.0521229	0265103
paysource	-.2411462	.3657765	-0.66	0.510	-.958055	.4757627
cons	.5330436	.7751357	0.69	0.492	-.9861944	2.052282
diffcurr						
diffprev	1.747174	.4703673	3.71	0.000	.8252706	2.669077
leadage	.0027524	.0358156	0.08	0.939	-.0674449	0729496

period	.0009127	.0043863	0.21	0.835	-.0076842	.0095096
mem	-.0057344	.0179759	-0.32	0.750	-.0409665	.0294978
homo	-.6568226	.6160377	-1.07	0.286	-1.864234	.5505891
logavloan	.1796168	.2062325	0.87	0.384	-.2245914	.5838249
aveage	-.0271191	.0379615	-0.71	0.475	-.1015222	.047284
female	-.7496658	.4373327	-1.71	0.086	-1.606822	.1074907
repayfr	.2989352	.3030985	0.99	0.324	-.2951271	.8929974
logincome	-.689398	.3756838	-1.84	0.066	-1.425725	.0469288

cons	4.86477	3.835979	1.27	0.205	-2.653612	12.38315
/athrho	-19.45847	3553.83	-0.01	0.996	-6984.837	6945.92
rho	-1	0		-1	1	

LR test of indep. eqns. (rho = 0):   chi2(1) =   4.76   Prob > chi2 = 0.0292