

**Determinants of participation in rotating savings and credit  
associations in urban informal settlements: Evidence from Mathare  
Slums, Nairobi.**

**Willy Mwangi Muturi**

**A thesis submitted in partial fulfillment for the degree of Doctor  
of Philosophy in Economics in the Jomo Kenyatta  
University of Agriculture and Technology**

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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature: ----- Date: -----

**Willy Mwangi Muturi**

This thesis has been submitted for examination with our approval as University supervisors:

Signature: ----- Date: -----

**Dr. Maurice Sakwa**

**JKUAT, Kenya**

Signature: ----- Date: -----

**Prof. Peter K. Kimuyu**

**UoN, Kenya**

## **DEDICATION**

This thesis is dedicated to my children Stanley and Alan; the role model for whom I wish to be.

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## **ABBREVIATIONS AND ACRONYMS**

<b>ASCAS</b>	Accumulating Savings and Credit Associations
<b>CBS</b>	Central Bureau of Statistics
<b>FFS</b>	Formal financial sector
<b>GDP</b>	Gross domestic product
<b>ICDC</b>	Industrial and commercial development corporation
<b>IIA</b>	Independence of irrelevant alternatives
<b>IDA</b>	Individual development account
<b>IFS</b>	Informal financial sector
<b>JLBS</b>	Joint loans board scheme
<b>KIE</b>	Kenya industrial estates
<b>MNL</b>	Multinomial logit
<b>MSEs</b>	Micro and small enterprises
<b>NGOs</b>	Non- Governmental Organisations
<b>ROSCAs</b>	Rotating Savings and Credit Associations
<b>SACCO</b>	Saving and credit co-operative society.
<b>USAID</b>	United States Agency for International Development.

## DEFINITIONS OF TERMINOLOGIES

- Informal finance** All financial transactions, loans, deposits outside the regulation of the central monetary authority (Ouma, 1991)
- Formal finance** All financial transactions under the control of monetary authorities. (Ouma, 1991)
- Informal Financial Institutions** All those institutions which provide informal finance including rotating savings and credit institutions (Roscas), mutual assistance groups, professional money lenders, part time money lenders, relatives and friends. (Ouma, 1991)
- Formal financial institution** Those financial institutions which provide formal finance. They include commercial banks, non -bank financial institutions, post office savings bank, micro-finance institutions, development finance institutions, mortgage finance companies and building societies and insurance companies (Ouma, 1991)
- Bidding roscas** Roscas which allocate the pot through bidding process (Kedir, 2011)
- Random roscas** Roscas which allocate the pot according to a random process (Kedir, 2011)

<b>Decision roscas</b>	Roscas which allocate the pot through a decision imposed by the governing body of the group (Anderson and Ballard, 2002)
<b>Round</b>	Refers to one complete cycle of the Rosca, in which all members have received fund (Anderson and Ballard, 2002)
<b>Jua Kali</b>	This is a Kiswahili term meaning “hot sun.” It is often used to refer to the informal sector where, supposedly the workers work under the hot sun. (Namusonge, 1999)
<b>Meeting</b>	Refers to one individual period in the Rosca in which members contribute funds and distribute the Rosca pot to one individual (Gugerty, 2007)
<b>Participation</b>	Membership or joining a rosca (Kedir 2011)
<b>Pot</b>	The proceeds from the rosca given to a participant. (Gugerty, 2007)
<b>Rosca</b>	A voluntary grouping of individuals who agree to contribute financially at each of a set of uniformly-spaced dates toward the creation of a fund, which will then be allotted in accordance with some prearranged principle to each member of the group in turn (Calomiris and Rajaraman,1998)
<b>Motives of Participation</b>	These are the reasons for which people join roscas (Gugerty, 2007)



**Probit Model**      A regression model used when the dependent variable is dichotomous. It assumes that the error is independent normally distributed (Maddalla, 1983)

**Logit Model**      A regression model used when the dependent variable is dichotomous. It assumes independence of the error term (Maddalla, 1983)

**Multinomial Logit model**      A regression model estimated when regressors vary across alternatives (Madalla, 1983)

## ABSTRACT

Participation in rotating savings and credit institutions is very prevalent in developing countries including Kenya. This is despite the fact that such participation is costly in terms of the opportunity cost of time spent in meetings and there is the risk of loss from defaulting participants. A question arises why people participate in roscas instead of saving on their own. Although studies on participation in rotating savings and credit associations in Kenya have been conducted in the past, they have not been rigorous and they have ignored the effects of such factors as ethnicity, religion, individual discount rates and recent innovations in electronic money transfer systems on participation in roscas.

The objectives of this study were to determine the characteristics of rosca participants, to determine the motives of participation in roscas and to determine how allocation decisions are made and to find out the preferred periods of receiving the pot. It uses both descriptive analysis and estimates econometric models of rosca participation, motives allocation decisions and preferred periods of receiving the pot using household level data generated from Mathare, in the oldest and one of the poorest Kenyan slums.

The key finding on rosca participation is that gender, individual discount rates, household size, education level and proportion of wife's contribution in the household's budget are on the upper hand the main determinants of participation in rotating savings and credit associations. Ethnicity and electronic money transfer services do not seem to affect participation in roscas. The study finds that

participation in roscas is for varied motives the main ones being saving, insurance, keeping away money from spouses and socialization. Those who participate for the saving motive include those households where spouses are not co-habiting, singles and the employed. Those who do so for socialization motive are those not co-habiting with their spouses, Muslims and the employed. The ones not co-habiting with spouses and those in informal business are the ones who participate for insurance motives while those co-habiting with their spouses and Muslims are the ones who participate to keep the money away from their spouses.

Majority of the participants do not prefer receiving the pot at the beginning of the rosca cycle which negates the hypothesis that participation in roscas enables participants to receive goods earlier than they would by saving alone. Majority also do not use the pot to purchase a durable good, shattering the lumpy-expenditure argument. Multinomial regression results show that households where both spouses live in the same house prefer to receive the pot at the end of the rosca cycle and so is the case for Muslims and households where the wife's contribution to the household budget is high. Negative and significant coefficients were observed for preferences at the time of opening schools for respondents who are employed either in the private sector or engaged in business regardless of whether such business is formal or informal.

Age, gender and marital status affect positively the decision to allocate the pot by balloting at the formation of the cycle while spouse living in the same house and household size affects such allocation decisions negatively. Positive coefficients for

allocation at the beginning of the rosca cycle were observed for age, discount rates and gender. Balloting at each meeting was positive for discount rate but negative for level of education.

As the study has shown that the majority of slum dwellers can and do save, then the feeling that they are too poor to save should be discarded. As roscas have been seen as commitment devices for saving, the study recommends those designing microfinance products to design programs which would ensure commitment through small but regular contributions.

As roscas serve several motives, design of micro-finance products should have the motives in mind and the target should be the participants with the characteristics which have been identified as the critical for participation to ensure a greater possibility of success.



## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.1 Background**

Savings can make an important contribution to development. Increasing the rate of economic growth depends heavily upon having the financial resources required for investment both mobilized and channeled to meet demand. It is for this reason that many financial institutions have cropped up to provide avenues for savings and provision of credit.

Kenya has a relatively developed formal financial sector with 48 commercial Banks. Kenya's financial sector grew steadily in the 1990s as indicated by the growth of the share of the financial sector in GDP from 7.9% in 1990 to 9.6% in 1994, and to 10% in 1997 (ROK, 1997, 1998). This share however declined in the 21<sup>st</sup> century to 5.6% in 2010 (ROK, 2011) McCormick and Pederson (1996) noted that Kenya has a large and growing financial services sector contributing in 1996 almost 10% of the cross Domestic product (GDP). Some of which have been specifically designed for lending to the MSEs sector. These include Kenya Industrial Estates (KIE), the joint loan Board Scheme (JLBS), among others. In addition, other institutions have developed within their portfolio, special credit programs for the MSE sector include industrial and commercial development corporation (ICDC) Kenya Commercial Bank Ltd., Barclays Bank of Kenya Ltd., Co-operative Bank of Kenya and National Bank of Kenya Ltd. Other sources of limited credit to the MSEs sector have been from the Non-Governmental organizations (NGO's) registered in the country and a

few small enterprise associations (Session Paper No. 2, 1992). According to the National Baseline Survey of 1999, only 10% of MSEs have access to credit.

Despite Kenya having a relatively well developed formal financial sector, access to them has been beyond the reach of ordinary citizens. A report released by the central bank of Kenya in 2009 (CBK, 2009) showed that only 22% of Kenyans are banked and thus have formal access to financial services through commercial banks, building societies and the Post Bank. An additional 17.9% are served by Savings and Credit Cooperative Societies (SACCOs) and Micro-finance institutions, 26.8% depend primarily on informal financial services such as Rotating Savings and Credit Associations (Roscas) and Accumulating Savings and Credit Associations (Ascas). It indicated that 32.7% of Kenyans are financially excluded, i.e. they have no access to financial services and are classified as “un-banked”, reporting no usage of formal or informal financial services. (CBK, 2009).

The reasons which have traditionally been given as behind this poor access to formal financial services include the distance between the urban-based formal institutions and the rural poor, which has been aggravated by poor transport and communication networks, long bureaucratic procedures. Lack of familiarity and interaction between them and the poor makes them un-approachable. Further, their lending policies displayed in forms of prescribed minimum loan amounts and complicated application procedures and restriction of credit for specific purposes complicate the problem. Their rules and regulations have created the myth that the poor are not bankable and since they cannot afford the required collateral, they are considered un-creditworthy. Following these arguments, formal financial institutions have

institutionalized flexible and attractive lending mechanisms for attracting all forms of clients including the informal sector participants but the informal financial sector continues to thrive side by side the formal financial institutions.

Many microfinance institutions have also come up but informal sector participants still rely on the informal financial sector to meet their savings and credit needs. Among the MSEs that do not receive outside financing the most frequent source was Rotating Savings and Credit Association (Roscas), Sethna, (1992).

The informal financial sector is the natural environment for people in developing countries and antedates the introduction of formal institutions. People are born in into this sector and it brings with it frequent face to face contacts, cultural affinity and a great ability to adapt to the conditions of low income life. The informal financial sector therefore plays an important role in provision of financial in developing countries. The informal financial institutions include rotating savings and credit associations (roscas) and accumulating savings and credit associations (Ascas), investment groups and welfare/clan groups.

A Rosca can be defined as “a voluntary grouping of individuals who agree to contribute financially at each of a set of uniformly-spaced dates toward the creation of a fund, which will then be allotted in accordance with some prearranged principle to each member of the group in turn” (Calomiris and Rajaraman,1998)

The basic principle of roscas is almost the same everywhere. A group of people gather for a series of meetings. At each meeting, everybody contributes to a common pot. The pot is given to only one member of the group. This member is then excluded from receiving the pot at future meetings, but still contributes towards it.



This process is disbanded or begins another cycle. The pot may be allocated randomly (random roscas), or through a bidding process (bidding roscas). For random roscas, while the original allocation order is chosen randomly, the order of the winners may, or may not, be repeated throughout the cycles until every member has received the pot. Roscas are popular among high- as well as low- income households and flourish in economic settings where formal financial institutions seem to fail to meet the needs of a large fraction of the population. They serve as a financial intermediary by transforming the bundled savings of a group into what might be considered a loan to one rosca participant in each period (Klonner, 2003).

Accumulating savings and credit associations (Ascas) also involve members contributing a fixed sum of money every month. Roscas and Ascas are similar to each other in the sense that they are both voluntary and independent groups with their own rules and no outside organization has control over them. The main difference between ascas and roscas is that each time a rosca group meets and savings are collected, the whole pot is then immediately in the same meeting redistributed to one or several members of the groups. Ascas do not give the funds to anyone, but lend the funds to willing borrowers with interest. The interest paid on the loans will then accumulate in the group fund. At the end of the year asca members often divide part of the profits (from interest payment) to the members. Running an asca requires more skills because some kind of book keeping is necessary, but the fact that people in Kenya use the term merry-go-round for both roscas and ascas is an indication that in their perception these two groups are very similar. Another example of the symbiotic relationship between ascas and roscas is

the fact that numerous ascas have within the group one or several rosca groups. And while the asca group meets the roscas also do their transactions. (Malkamaki and Johnson, 2009) Investment clubs are more recent phenomena. People come together to form a group in order to invest in property or business. Several investment groups also invest in the stock market. Welfare/Clan Groups do not intermediate funds but provide financial support for members and their next of kin in the case of illness, death etc. (Malkamaki and Johnson,2009))

Rotating savings and credit associations (roscas) are the most prevalent forms of informal financial institutions in developing countries (Ambec and Treich, 2007). They involve between 50% and 95% of the adult population in several African countries and mobilize about one-half of national savings in Cameroon (Bouman, 1995). Studies in Kenya have also shown the prevalence of roscas For example, Kimuyu (1999) found that between 45-50% of the respondents in Central Kenya belonged to roscas. Anderson and Baland (2002) found that in 57% of the households in Kibera slum at least one person belonged to a rosca. Similarly, Johnson (2004) found that 49% of respondents in Central Kenya belonged to roscas whereas 9% belonged to independent ascas and 6% to managed ascas.

Further, the data from both the Western rural and Nairobi indicate that rosca members were more likely to be women (Gugerty 2007). Similarly Johnson (2004) found that in Central Kenya, 66% of women in the sample were rosca participants compared to 30% of men.

Malkamaki and Johnson,(2009)) showed that roscas are the most widely used informal groups in Kenya (28.3%), meaning that close to 5 million adults are members of at least one rosca group.

## **1.2 Statement of the problem**

In many countries in Africa, the informal financial sector co-exists with the formal financial sector. Available evidence suggests that informal financial sector is larger than the formal financial sector. In Kenya, for example a report released in 2007 by the Banking Supervision department of Central Bank of Kenya in collaboration with representatives from the financial sector reported that only 19% of Kenyans are banked and thus have formal access to financial services through commercial banks and building societies and the post bank. An additional 8% are served by SACCOs and Micro-finance institutions, 35% depend primarily on informal financial services such as Rotating Savings and Credit Associations (roscas) and Accumulating Savings and Credit Associations (ascas) (CBK 2007).

Of the informal financial institutions, Rotating Savings and Credit associations are the most prevalent in developing countries. In Kenya for example, among the unbanked population who use informal financial institutions, 28.3% use roscas, 9.1% use welfare/clan groups, 4.8% use independent Ascas, 3% use investment clubs while 1% use managed Ascas (Malkamaki and Johnson, 2009)

Participation in roscas is costly. For example there is the opportunity cost of time spent attending meetings. Moreover, members suffer from the risk of default from other members which could eventually lead to the breakdown of the rosca. There is

also less flexibility than saving on their own as the rosca saving rate is likely to differ from their optimal saving rate.

Despite all these costs, these groups enjoy popularity. This brings the question as to why individuals would decide to join a rosca instead of either using banks or saving on their own. No consensus has been reached by researchers on the answer to this question yet Knowledge of the motives for joining roscas would be useful in the design of microfinance products for the un-banked population. Researchers on roscas have attributed rosca participation to lack of access to formal savings and credit markets. The Kenyan situation is however different as formal financial market is however very developed and accessible yet participation in roscas is still widespread. There is also very limited quantitative evidence of the theories put forward on the determinants of rosca participation especially at the household level yet such knowledge is very fundamental in addressing such issues as the potential complimentary or substitutability of roscas. The studies which are available are either descriptive or outdated. This study fills this gap by conducting a rigorous analysis of the determinants of rosca participation in a Kenyan urban informal settlement.

### **1.3 Objectives of the study**

The overall objective of this study was to explore participation in rotating savings and credit associations in urban informal settlements. It looks at who are most likely to participate in these institutions and their motives for participation.

The study focused on the following specific objectives: -

- (i) To determine the demographic, socio-economic and psycho-social characteristics of rosca participants.
- (ii) To determine the motives for participation in roscas.
- (iii) To find out how allocation decisions of the rosca funds are made.
- (iv) To find out the time preferences of receiving the rosca pot.

#### **1.4 Research Questions**

Drawn from the above objectives, the study sought to answer the following questions:

- (i) What are the demographic, socio-economic and psycho-social characteristics of rosca participants in urban informal settlements?
- (ii) What are the motives for participation in roscas?
- (iii) How are allocation decisions of rosca funds made?
- (iv) What are the time preferences of receiving the rosca pot by participants?

#### **1.5 Justification of the study**

Understanding how communities develop financial institutions that overcome market imperfections is important for several reasons. Theoretical work on income distribution and wealth suggests that disparities in income and wealth in the presence of credit market imperfections can lower long-run growth. The study of roscas illuminates how communities can develop institutions that overcome these

market imperfections. Savings are essential in asset accumulation; understanding how and why the poor save is therefore critical to reducing poverty and inequality. Unequal access to resources may also hinder the development of effective mechanisms for local governance, either because lower levels of trust make strategies more difficult to sustain or because norms of reciprocity and fairness may diverge. In countries or communities with missing economic markets, weak states or ineffective local political institutions, it is important to understand how citizens build institutions that compensate for missing political and economic markets.

From a policy perspective, understanding how informal financial institutions are organized is important for several reasons. The growing microfinance movement has adopted many of the principles of roscas in developing group lending programs, yet there is little empirical evidence on the effectiveness of these principles in sustaining such programs. Moreover, many microfinance institutions are expanding to provide a wider range of banking and savings services to the poor. Understanding how lower income individuals save will be critical in designing appropriate and effective banking products for the poor.

Rotating savings and credit associations are among the oldest and most prevalent savings institutions found in the world and play an important role in savings mobilization in many developing economies. Moreover, given general disappointments with institutional finances of all kinds assisting the poor in accessing credit, a number of NGOs and private voluntary organizations have begun to ask how some informal mechanisms the poor have turned to can be emulated or adopted in order to channel savings and credit through them. The results of this

study will thus go a long way in assisting these organizations in designing their programmes.

A better understanding of how these markets operate, how they are structured, how they impact on the economy, how they influence investment decisions is needed. With this understanding, the question is whether they should be aided, strengthened or financially enforced so that greater development impact and wider participation can be attained through them. The study is significant to a number of organizations namely the government, research institutions and development organizations

#### **The Government:**

Monetary policy authorities have tended to ignore the IFS because of lack of knowledge about their size, operations and relationships between them and the FFS. As a result, the desired effects of monetary policies have not been achieved. This study provides the necessary information that will enable their incorporation in monetary policy.

#### **Academics and researchers**

The study increases literature on the structures of informal financial institutions and is therefore useful for academics interested in the field of study.

#### **1.6 Limitations of the study**

The data were collected on only one urban slum. It may be difficult to replicate it in rural areas of the country. However, it is an important step in understanding informal markets in urban areas. Other limitations of the study are:

### **Accessibility**

The housing units in the area are very similar to one another and there are no major landmarks that could help identify one set of enumeration area from another. This was compounded by the fact that they are not properly planned and therefore accessing them was not very easy.

### **Absenteeism of respondents:**

Sometimes it was difficult to access the respondents especially during the week days. This is because some of them were working outside the slum area

### **Respondents' fatigue**

The research data was collected just a few months after the national census was conducted. Other researchers were also collecting data in the same area among the same respondents. Some of the respondents showed research fatigue and felt that they were being asked so many questions without any tangible benefit. Research assistants took some time convincing them to give the required information. Some respondents were unwilling to give information because information about finances is confidential. They feared that it could be leaked to others.

### **Resolving the Challenges**

To solve the problem of suspicion and inaccessibility, the researcher approached the chief of the area and asked to be introduced to enumerators who had participated in the population census conducted a few months earlier. These enumerators were from



the area and they were familiar with the residents. Luckily, during the population census, the houses were numbered and therefore the same numbering was used.

The problem of absenteeism of the respondents was resolved by working throughout the week including weekends. This ensured that the household heads who were unavailable during weekdays were visited over the weekend. Sometimes neighbours were used to locate the respondents or came back late in the evenings. While this significantly delayed the completion of the data collection exercise, it was helpful in generating fuller information.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents a review of the literature on rotating savings and credit associations. It starts with reviewing the importance of the informal sector; it then presents a review of the formal financial sector in Kenya. It then reviews the informal financial sector in Kenya before proceeding with a discussion of roscas; the motives for which people participate in them, characteristics of rosca participants, how the rosca pot is allocated and the preferred periods of receiving the rosca pot.

#### **2.2 The importance of the informal Sector**

Rapid industrialization was for several decades regarded as an attractive and effective strategy for transforming developing economies and maximizing their rates of economic growth.(Liedholm and Chuta, 1976). In line with this belief, many developing countries, at independence adopted the route of furthering import substitution strategy aimed at promoting growth of large scale enterprises with the premise that they would create employment and enhance economic growth through trickledown effect. Evaluation of these policies, however revealed that they could not promote economic development and create employment as envisaged on the onset. (Gakure and Otieno, 2006).

The International labour organization (ILO) sponsored surveys on labour markets in developing countries in the 1970s. In Sub-Saharan African countries, the study showed that the informal sector was creating more employment than the formal sector. It highlighted a host of advantages of the informal sector. This sector is well

placed to have economic, social and political roles in employment creation, resource utilization, income generation and equitable distribution of resources in addition to helping promote change in a gradual manner thereby solving social and economic problems which might create social upheavals if not well attended to. The findings of this study prompted the Kenya government to shift gears in its macroeconomic policies (Gakure and Otieno,2006)

This role of the informal sector in employment creation was confirmed by the National Micro and Small Enterprise Baseline Survey of 1999, which showed that there were about 1.3 micro and Small enterprises employing nearly 2.3 million people or 20% of the country's total employment and contributing 18% of overall GDP and 25% of non-agricultural GDP. This contrasted to 1.6 million people who were employed in the formal sector. (Republic of Kenya, 1999). The recent economic survey (Republic of Kenya, 2011) indicates that this sector accounts for 80.6% of total employment in Kenya. By 2010 informal economic activities provided employment for 8,829.9 thousand up from 8,388.9 thousand in 2009, an increase of 5.3%.

The 2011 Economic survey notes that this sector covers all small-scale activities that are normally semi-organized, unregulated and uses low level or no technology makes it an avenue for employment creation. With the restructuring and rationalization of the public sector and the deregulation of labour markets in the private sector, the informal sector, the informal sector phenomena has assumed significant proportions. Displaced workers from both the public and private sectors

are forced to seek or create opportunities in the informal sector. Funds provided by the Government to women and the youth has also played a role in providing the capital for entrepreneurs venture in the economy (Republic of Kenya, 2011)

In terms of its contribution to GDP, the baseline survey indicated that, this sector was contributing 18.4% in 1999 which had risen from 13.8% in 1993. Because of this contribution, this sector was recognized as pivotal in poverty reduction in Kenya. The poverty Reduction Strategy Paper of 1999 stated that a large number of Kenyans derive their livelihood from the MSE sector and therefore development of this sector represents an important means of creating employment, promoting growth and reducing poverty in the long-run.

Namusonge (1999) indicates the significant contribution of the informal sector as including provision of goods and services; creation of employment; development of a pool of skilled workers; strengthening the links among sectors of the economy; flexibility and adaptability to market changes; use of local resources; creating demand and supply and promotion of rural and urban balance.

According to Misati (2007) the most prominent informal sector activity done by more women in the slums is the selling of vegetables and fruits. This uses the family labour and also provides the household with food. Women establish social connections which enable them maintain a chain of customers and trust building, ensuring staying in business. Slum dwellers spend most of their income on food and housing.

The slum dwellers engage in the varied activities in the informal sector as the only way of coming out of the poverty. However small the activity, it helps in one way or

the other in generating income for the poor in the urban areas in Kenya and Africa. The governments should embark on ways of developing and improving the livelihood of these poor urban dwellers. The basic and priority needs should be identified: water, housing, electricity and waste disposal as well as access roads so as to reduce the insecurity and enable informal activities develop.

Financial support should be extended as well as encouraging the people to save and open bank accounts since without a bank account it proved hard to access any loan in Kenya. Diversification of the economic activities should be promoted to avoid duplication of efforts in one place, e.g. many women selling vegetables and fruits at the same place.

Despite this important contribution, however, only 10.4% of the MSEs received formal credit and other financial services.

### **2.3 Kenya's Formal financial sector**

Kenya's financial sector grew steadily in the 1990s as indicated by the growth of the share of the financial sector in GDP from 7.9% in 1990 to 9.6% in 1994, and to 10% in 1997 (ROK, 1997, 1998). This share however declined in the 21<sup>st</sup> century to 5.6% in 2010 (ROK, 2011) The assets of the banking system more than doubled between 1990 and 1995, while those of the non-bank financial institutions (NBFIs) increased by 16% over the same period. The composition of the institutions as at 2010 consisted of 43 commercial banks, 126 forex bureaus, 5 deposit taking microfinance institutions, one credit reference bureau 16 non-bank financial institutions. Six banks had applied for Agent Network approval out of which two had been approved with 5892 agents out of which 4392 were telecom related. There were 46 licensed

insurance companies, 158 insurance brokers and 3788 insurance agents. There were 6473 registered Savings and Credit Cooperative societies (SACCOS) out of which 3466 were active. Among the active ones, 219 were operating Front Office Savings activities (FOSAS) with an accumulated total asset of Ksh.150 billion representing 76% of all the combined assets of active SACCOS (ROK, 2011).

McCormick and Pederson (1996) noted that Kenya has a large and growing financial services sector contributing in 1996 almost 10% of the cross Domestic product (GDP). Some of which have been specifically designed for lending to the MSEs sector. These include Kenya Industrial Estates (KIE), the joint loan Board Scheme (JLBS), among others. In addition, other institutions have developed within their portfolio, special credit programs for the MSE sector include industrial and commercial development corporation (ICDC) Kenya Commercial Bank Ltd., Barclays Bank of Kenya Ltd., Co-operative Bank of Kenya and National Bank of Kenya Ltd. Other sources of limited credit to the MSEs sector have been from the Non-Governmental organizations (NGO's) registered in the country and a few small enterprise associations (Session Paper No. 2, 1992). According to the National Baseline Survey of 1999, only 10% of MSEs have access to credit. Among the MSEs that did receive outside financing the most frequent source was Rotating Savings and Credit Association (ROSCA's), Sethna, (1992).

Despite Kenya having a well developed formal financial sector, however, access to it still remains a problem. A survey conducted by the Central bank of Kenya in 2009 observed that only 22.6% of the Kenyan population aged over 18 years were included in formal finance, a figure which had risen from 18.9 in 2006. Use of non-

bank financial institutions had risen from 7.5% in 2006 to 17.9% in 2009 while use of informal finance had dropped from 32.7% in 2006 to 26.8% in 2009. The population who were financially excluded was 32.7 in 2009. (CBK, 2009). The bulk of the population thus is either excluded or uses informal finance and hence the importance of the informal financial sector.

#### **2.4 The importance of the informal financial sector**

The importance of this sector gained prominence following the works of McKinnon (1973) and Shaw (1973). They argued that restrictive government financial policies shift the allocation of investible funds away from the market and make this a function of government. This happens as governments try and manage credit allocation through subsidies interest rates ceilings and direct intervention. As interest rates are kept artificially low, often in times of high inflation, the demand for loans is raised. At the same time, formal lenders may find the depressed normal rates unattractive as they are unable to adjust their cost structures adequately to meet the official standards. In attempting to cut back on supply, the shifting of loans to their least risky clients is expected to lead to many of the rationed out clients spilling over to informal sources of finance. Proponents of this view (e.g. Fry 1995, Taylor 1983) argue that the existence of the informal financial sector is a reaction to policy distortions or financial repression. Since the informal sector is not subject to regulation, it is more efficient than the formal one. The remedy for this relative inefficiency of the formal credit market may be seen in financial liberalization. This view does not reflect the situation in Kenya and less developed countries because despite interest rate liberalization, the informal financial sector continues to thrive.

The other view, supported by Adams 1992, Wai 1992, Van Wijnbergen 1982 is that the informal sector has a comparative advantage in some market segments notwithstanding financial liberalization. They argue that while it is costly for formal institutions to acquire information, informal agents can utilize local personal information resulting in monopoly power. Moreover, weak legal systems inhibit contracts enforcement, which results in credit rationing of potential borrowers without collateral. Informal agents can fill such market segments and collateral can be replaced by reputation, group responsibility and inter linked transactions. Several researchers (Aredo, 1993, Bouman 1977, Chandavaskan, 1985, Miracle et.al 1980, Bouman and Houtman 1988) support this view of the informal financial sector having certain advantage over the formal sector. The average scale of operation and cost of lending and recovering, they argue, is small; there is freedom of entry and exit and it is freed from Central Bank counters, information gathering is kept to the minimum while trust and firsthand knowledge of a participant are important and the purpose is for both consumption and investment).

Informal finance has been found to be more important than formal finance in different countries. In Ghana, for example, Aryeetey and Gockel (1991) found that informal savings constitute 60% of total financial savings in rural areas.

Chipeta and Mkandawire, (1991), they found that the informal financial sector in Malawi is larger than the formal and semi-formal sector. They argued that the effectiveness of monetary control could be reduced if borrowers can evade the controlled money market by using the informal market. Further, the informal financial sector plays an important role in alleviating economic hardships among



low-income groups. It enables them to mobilize resources (the savings effect) and to use those resources to earn income (the investment effect). Considering the informal sector as a whole, they observed that a significant part of the loan does not bear interest, which is contrary to the common belief that interest rates in the IFS are generally higher than in the FFS

Alila (1993) studied informal credit in Nyakach in Nyanza Province and Vihiga in Western Province. He observed informal-formal credit relationships, which are person-to-links, built over time. He further observed that access to informal credit is relatively easy either individually or in-group and on terms and conditions that suit even the rural poor. A strong opinion expressed by an overwhelmingly majority (90%) of those interviewed was that informal borrowing and lending should be encouraged contrary to a widespread negative view that it should be discouraged because it is exploitative and inefficient.

The local people felt that this type of credit had contributed to the development within the villages. There had been for example development in education and farming, co-operation had been enhanced, the needy helped and investment encouraged.

Mburi (1994) in his survey of informal financial markets in Nairobi found that only 6% of his respondents obtained credit from formal financial institutions. The reasons for borrowing from informal sources were fear of banks, lack of information and procedures of how to obtain bank loans and lack of collateral. Informal financial markets on the other hand were found to be easily accessible, do not require physical collateral and are fast in processing loans without long bureaucratic procedures.

Ouma (1991) found in a study of informal financial sector in Siaya that the informal financial sector is more dominant than the formal financial sector. Some 73% of his respondents said they relied on the informal financial sector for their financial needs. The reasons for the low borrowing rate from banks were given as collateral requirements and the fact that they were located far away.

Kibuuka (2006) summarizes the propositions put forward to explain the popularity of informal financial services. First, it offers a disciplined environment for saving. Once the initial decision to join a rosca has been made, withdrawal can only take place at the end of the cycle, otherwise they face peer pressure or even sanctions should they pull out. Second, unlike formal financial institutions, informal institutions offer individuals a chance to save in small installments, which particularly suit the poor. Third, there is convenience and a sense of formality. This implies that no forms are completed. This eliminates reliance on documentation, which in turn removes literacy constraints and reduces the waiting period for processing a transaction as well as transaction costs. The financial services are usually provided near users' residences or place of work and may be provided outside working hours.

Fourth, the largest proportion of transactions take place between parties that are well known to each other and those who live or work in the same vicinity. This reduces the information asymmetry and transaction costs faced by both parties in the deal. Fifth, the transactions are usually carried out within familiar communal networks. This eliminates the feeling of intimidation and discomfort experienced in banks due to unfamiliar surroundings, exposing personal problems to strangers and frequent

use of languages in which users may not be able to fluently express themselves. Sixth, there is reciprocity in borrowing. This serves as a kind of access to a liquidity guaranteeing function, which is especially important to business operators. In addition, it continues to build social collateral and this is the same as a two-directional overdraft facility. Finally, most transactions in the informal sector take place “free from official eyes” and since institutions are not registered, no government taxes are payable. This creates a form of cost-cutting opportunity for users. (Kibuuka, 2006)

Informal financial institutions are also education institutions. This is particularly so in roscas where members discuss with each other what they intend to do with the lump-sum. If one for example intends to buy a refrigerator, they discuss the best make. Business education is also provided to those who need it (Kibuuka, 2006). Johnson (2004) observes that members of roscas learn how to speak well in public and older women teach the younger ones how to handle things in their homes and discuss with their husbands.

Several factors can also be attributed to the popularity of roscas. Besley and Levenson (1994), for instance, point out that roscas can act as a solution for credit constraint by pooling the resources of members. Roscas also act as an alternative institution to formal financial institutions which have not yet been developed, especially in the rural areas of many developing countries.

Given the difficulty of accessing banks and other formal institutions, many people find roscas to be an attractive alternative to save money for business investment

and/or purchasing durable goods. In some places, roscas are established as a supporting network that includes people living in the same community or family (Gugerty, 2007).

Apart from improving financial access, this sector, by assisting the informal sector to grow leads to more employment creation, poverty reduction and also increases social and economic participation of the majority in the population.

## **2.5 Theoretical framework**

Roscas became subjects of formal analysis recently following the pioneering work of Besley, Coate and Lury (1993). They took the view that roscas are primarily used to save up for the purchase of an indivisible durable goods. According to them, random roscas are not particularly effective as institutions for buffering against risk, since the probability of obtaining the pot need to be associated with one's immediate circumstances. Besley et.al argued that even bidding roscas which may allow a member to obtain the pot immediately only permit individuals to deal with situations that cannot recur since the pot cannot be received more than once. Furthermore, they argued, since many risks in LDCs are covariant, individuals will have high valuations at the same instant. Roscas play a big role in life-cycle needs such as financing a wedding. Even in this context, however, roscas are more appropriate for dealing with significant, idiosyncratic events rather than the lump saving required for old age.

The existence of indivisible goods and the absence of access to external funds make individuals to save to finance lumpy expenditures and can gain from trading with one another whereby the savings of some individuals' finances then purchases

others. Roscas thus provides a means of making joint savings work and also determine a rule for rationing access to the indivisible good.

Besley et.al. (1993) used a simple model that can capture the essential features of the problem at hand to illustrate the gains of roscas. In their model, individuals earn an income,  $y$ , in each period which can either be consumed as monetary consumption,  $m$ , or saved in order to purchase an indivisible good at cost  $B$ . The indivisible good does not depreciate, and once purchased, it yields a constant flow of services for the remainder of an individual's lifetime,  $T$ . They make some further assumptions which simplify the framework: First, there is no access to credit markets for the members of the rosca. This assumption implies that individuals cannot borrow money, eliminating both formal banks and money lenders as an option to finance the indivisible good. The only options left are to save on their own for the good or pool their resources by creating a rosca.

Second, individuals have identical, inter-temporally additive preferences. This assumption removes any heterogeneity between individuals' valuations of goods. Also, the value of having a good in the present period is independent of having it in another period.

Third, there is no discounting. Consumption today is valued the same as consumption tomorrow. Finally, they assume that an individual's instantaneous utility depends on monetary consumption,  $m$ , and on whether or not he/she enjoys the services of the indivisible good. This utility is denoted  $u(m; 0)$  with no indivisible good, and  $u(m; 1)$  when owning the indivisible good.  $u(\cdot, 0)$  and  $u(\cdot, 1)$  are increasing, strictly concave and three times continuously differentiable in  $m$ . The utility function displays standard properties.

Individuals aim to maximize their lifetime utility subject to a budget constraint which yields the following utility function for an individual who finds it optimal to purchase the indivisible good:

$$\max \{tu(m, 0) + (T - t)u(y, 1)\} \quad s.t. \quad t(y - m) = B; 0 \leq m \leq y$$

An individual can choose to consume or save, constrained by his/her income  $y$ . Once he/she has saved enough to purchase the indivisible good  $B$ , which occurs in period  $t$ , the individual can enjoy the indivisible good for the remaining time  $T - t$ . The choice for the individual is to find the optimal combination of  $t$  and  $m$ , where he/she prefers more consumption and less time saving. Figure 2.1 illustrates this trade-off. The individual prefers more consumption and less time saving, so the indifference curves are upward sloping. Utility level  $A_3$  is preferred to  $A_2$  which is again preferred to  $A_1$ . An individual who wants to save a constant amount of his/her income,  $y$ , each period in order to purchase a good,  $B$ , is restricted to the budget constraint,  $t = B/(y - m)$ , illustrated by the convex curve. The optimal pair  $(t, m)$  is the one corresponding to the maximal utility the individual can obtain at this budget constraint, which in this case is  $(t^*, m^*)$ .

After inserting the constraint, rewriting and solving the maximization problem, the maximum value of lifetime utility,  $W_a$ , can be written as:

$$W_a = T u(y, 1) - B\eta(0) \quad \eta(\alpha) = \min_{0 \leq c \leq y} \frac{[u(y, 1) - u(m, \alpha)]}{y - m} \quad 0 \leq \alpha \leq 1$$

The first part of this expression tells us the lifetime utility if the indivisible good were free, and could then be enjoyed for the whole lifetime along with the maximal instantaneous consumption. The second expression shows the minimal utility cost of saving up for the indivisible good. Each individual is able to enjoy the indivisible good after  $t$  periods, where  $t$

is the same for all. This is not an efficient allocation, because in this situation, there is enough money in the collective group after  $t/n$  periods for someone to buy the indivisible good and start enjoying it right away.

The value of the parameter  $\alpha$  in the equation above, measures the gain from a rosca. If each individual is able to join a rosca with the same preferred consumption pattern, so that  $m$  is equal to the rosca savings in each period and  $t$  is equal to the number of members, it is easy to illustrate the gain from receiving the pot early. At the one extreme, if you receive the first pot in a rosca, your valuation is  $u(m, 1)$  for all  $t$  periods of the rosca rotation, so  $\alpha = 1$ . At the other extreme, you receive it last and are no better off, and your valuation is  $v(m, 0)$  for all  $t$  periods, so  $\alpha = 0$ . For the recipients between these extremes,  $\alpha$  is a decreasing function of the time until one receives the pot.

If the order of recipients is unknown when deciding to start a rosca, individuals must compare their welfare from saving for the indivisible good on their own with the ex-ante expected welfare from saving for the indivisible good with a rosca. In a rosca with  $n$  members contributing  $B/n$  at meetings which are held at equally spaced dates for the duration  $t$ ,  $\{t/n; 2t/n...t\}$ , and where the order of recipients is decided randomly, the amount of time each member expects to have the indivisible good in the interval  $[0, t]$  is  $\tau = [(n + 1)/ 2n] t$ . For instance, if a rosca meets once a month for six months ( $t = 6$ ) and there are six members ( $n = 6$ ), the meeting times would be  $\{1, 2, 3, 4, 5, 6\}$  and  $\tau$  would equal  $7/12$ . If, however, there were only three members, the meeting times would be  $\{2, 4, 6\}$  and  $\tau$  would equal  $2/3$ .

The individual's lifetime expected utility from joining a random rosca is:

$$W(m) = t \{ [(n + 1)/2n] u(m, 0) + [(n - 1)/2n] u(m, 1) \} + (T - t)v(y, 1)$$

By maximizing this problem and setting  $\bar{\alpha} = (n + 1)/2n$ , we find the expression:

$$W_r = Tu(y, 1) - B \eta(\bar{\alpha}) \quad \eta(\bar{\alpha}) = \min_{0 \leq c \leq y} \frac{[u(y, 1) - u(m, \bar{\alpha})]}{y - m} \quad \frac{1}{2} < \bar{\alpha} \leq 1.$$

When comparing this expression to  $W_a$ , the expected lifetime utility of saving for the indivisible good under autarky, Besley, Coate and Loury (1993) are able to show that the individual is ex ante better off when saving in a random rosca since  $W_r - W_a$  is positive.

Besley and Levenson (1996) find that rosca members are more likely to own indivisible goods when controlling for income and the endogeneity of participation, which supports their model.

This model is however limited in several ways. First, it assumes that people participate in roscas only because of lack of access to credit markets. Empirical evidence has shown that even people with access to formal credit markets participate in roscas. Second it assumes that the only motive for participation in roscas is purchase of an indivisible durable good. Evidence has shown that the use of rosca funds is not necessarily for purchase of such goods. Third it assumes that the participants would prefer to receive the rosca pot earlier than later as that is when they would maximize on the benefits of participation. Evidence has also shown that they do not necessarily prefer receiving the pot earlier rather than later. Furthermore, it ignores the effects any demographic socio-economic and psycho-socio characteristics of the participants may have on their participation.



## **2.6 Empirical Literature**

### **2.6.1 Prevalence of Rotating Savings and Credit Associations**

Roscas are found worldwide and in countries with vastly different levels of economic development. Rosca participation is particularly high in Africa. Estimates suggest that in 1986, 50 percent of the adult population in the Congo belonged to a Rosca, while participation ranges from 50 to 95 percent in many rural areas in Liberia, Ivory Coast, Togo, and Nigeria (Ardener and Bouman 1995). In 1992, membership in Roscas in Cameroon was estimated at 80 percent of the adult population (Ardener and Bouman, 1995) and in several villages in Nigeria in 1987, adult membership was found to be 66 percent of the population. In a sample in urban Zimbabwe, 76% of urban market traders participate in a Rosca, even though 77% of these traders have a bank account (Chamlee-Wright 2002).

The annual sums mobilized by roscas have been estimated to be between 8 and 10% of GDP in Ethiopia and half of the national savings in Cameroon and twice as high as the total credit of the organized banking sector in Kerala, India (Bouman, 1995). Rosca participation is not limited to developing countries. While Roscas are often found in economies where formal credit markets are thin or non-existent, they are also found in more developed economies among sub-groups who have been traditionally excluded from mainstream financial services, as well as among individuals who have reasonable access to formal banking institutions. Roscas have been reported among employees of the IMF (Ardener and Bouman, 1995) and among bank employees in Bolivia (Adams and Canavesi 1992) and Ghana (Aryeteey et.al, 1997). In countries such as Taiwan with relatively well functioning

credit markets, as many as 80 percent of adults are estimated to belong to Roscas (Besley and Levenson 1996).

Kan (2000) found roscas to be an important source of funds for capital accumulation in Taiwan between 1972 and 1992. All these are indications of the prevalence of roscas over the other informal sector actors.

In Kenya, Malkamaki and Johnson, (2009) estimated that a total volume of some Kshs.65bn (close to US\$1bn) is being intermediated through informal mechanisms on an annual basis. Kimuyu (1999) showed that in central Kenya 45 percent were participating in a Rosca while in Nairobi, Masinde and Nzioki (1991) observed that after blood relatives, ‘women’s groups’ was the most prevalent category of sources of funds. Although their research did not ascertain the money that goes through these groups, they argued that their importance was discernible in both the social and economic fields. They further argued that these groups are a likely form of mobilization of women’s savings in both in the rural and urban areas in Kenya. According to them, at individual level, women may lack the inclination or will to go to formal financial institutions to save or seek an advance or small amounts of cash as those likely to be handled by small women entrepreneurs.

Ouma (1991) found that whereas the majority of his respondents preferred the informal financial sector to the formal financial sector, the highest prevalence usage of informal financial institutions were mutual assistant groups and associations (which are in fact roscas).

Alila (1993) observed that in his sample in Vihiga, Kenya, membership of roscas was 64% while it was 35% in Nyakach. In addition more than one third of those who were members of roscas in Vihiga belonged to more than one rosca.

Atieno (2001) observed that in her sample in Siaya district, Kenya that 86% of her respondents had obtained their initial capital for starting their enterprises from informal sources while 87% had obtained their operating capital from informal sources. Some 44% of the respondents who had ever borrowed had done so from roscas while only 14% had borrowed from both NGOs and suppliers, 8% had borrowed from relatives and friends while only 1% had borrowed from moneylenders. Aketon, Sawada and Otsuko (2006) conducted a survey with owners of small enterprises in Kenya and found roscas to be the most important sources of credit in terms of loan size.

Anderson et al found that in 57% of the households in Kibera slum at least one person belonged to a rosca. Similarly, Johnson (2004) found (in a small purposeful sample) that 49% of respondents in Central Kenya belonged to roscas whereas 9% belonged to independent ascas and 6% to managed ascas.

Further, the data from both the Western rural and Nairobi indicate that rosca members were more likely to be women (Anderson et al. 2004; Gugerty 2007). Similarly Johnson (2004) found that in Central Kenya, 66% of women in the sample were ROSCA participants compared to 30% of men.

Malkamaki and Johnson,(2009) showed that ROSCAs are the most widely used informal group in Kenya (28.3%), meaning that close to 5 million adults are members of at least one ROSCA group.

### **2.6.2 Motives for participation in roscas**

No consensus has been arrived at in the literature on why people save in roscas. Among the motives put forward by theoretical and empirical literature on why people participate in roscas include:

#### **Financing the purchase of an indivisible durable good**

In their pioneering work on the economics of roscas, Besley, Coate and Loury (1993), took the view that roscas are primarily used to save up for the purchase of an indivisible durable goods. According to them, random roscas are not particularly effective as institutions for buffering against risk, since the probability of obtaining the pot need to be associated with one's immediate circumstances. Besley et.al argued that even bidding roscas which may allow a member to obtain the pot immediately only permit individuals to deal with situations that cannot recur since the pot cannot be received more than once. Furthermore, they argued, since many risks in LDCs are covariant, individuals will have high valuations at the same instant. Roscas play a big role in life-cycle needs such as financing a wedding. Even in this context, however, roscas are more appropriate for dealing with significant, idiosyncratic events rather than the lump saving required for old age.

The existence of indivisible goods and the absence of access to external funds make individuals to save to finance lumpy expenditures and can gain from trading with one another whereby the savings of some individuals' finances then purchases

others. Roscas thus provides a means of making joint savings work and also determine a rule for rationing access to the indivisible good.

Kibuuka (2006) observed that in South Africa, one of the main aims of participation in roscas among the higher income groups was saving though not for purchase of an indivisible good but for holidays and for parties during the festive season.

Basu (2008) argues that by joining a rosca, agents have the possibility of consuming the indivisible good earlier than they would be able if they saved on their own

Consistent with the early pot motive, Kedir (2010) observed that the majority (45%) of rosca participants in Ethiopia were participating with the aim of purchasing a durable consumer good.

This theory is however flawed in that once the order of allocation is determined; the last person in the order has the incentive to leave the rosca, since he/she realizes no advantage through rosca membership. Participants may also care about when in the calendar year they receive funds, the cost of hosting the rosca, and the probability that other participants will make payments (Gugerty, 2007). Moreover, studies (eg Anderson and Baland 2002) show that while the pattern of allocation was decided in the first round of the rosca, the same pattern is repeated and there is no justification why the last person should retain his membership knowing very well that he will be last.

### **Intra-household conflict**

Anderson and Baland (2002) provided another rationale for participation in roscas as intra-household conflict over savings and consumption patterns. Using data from

Roscas in a low-income neighborhood in Kibera, Nairobi, they showed that married women were more likely than men to join Roscas because of a stronger preference for saving for indivisible goods. They observed that 84% of rosca participants were women, a phenomenon which, they argued could not have arisen randomly. In their study, the probability that a woman participated in a rosca was 40.0 percent. If she lived in a couple, this probability rose to 53 percent, while it fell to 25.3 percent if she did not live in a couple. When she was working, her participation rate increased to 68.5 percent and to 74.4 percent if she simultaneously lived in a couple. The participation rate for men was 10.1 percent, for working men 12.4 percent, and for working men living in a couple it was 9.6 percent.

Among the socio-economic determinants of rosca participation, they found out that being a female, and being the female member of a couple were important determinants of rosca participation. (Married males, on the other hand, were less likely to join a rosca,

Female share of couple income was also a significant determinant of rosca participation. The relationship was an inverted U whereby there was very little participation when the weight in female decision –making in the household is very low, but it increases with her decision-making power. For a very high female weight in household decision making, household savings are close to female savings and the need for a woman to join a rosca is less. The general wealth level of the household was insignificantly related to rosca participation. The number of years spent in Kibera was a significant determinant of rosca participation, where individuals who had spent at most two years in the slum were less likely to join a rosca.

Native language (or ethnic identity) was also significant, supporting the notion that familiarity and trust foster the possibility of informal collective arrangements. The age of individuals was significantly related to the probability of joining a rosca: the relationship was concave and began to decrease at 35 years of age. This result coincided with the notion that individuals needed time to establish themselves and to develop more long-standing relationships with others, but also with the idea that the demand for indivisibles tended to be higher among younger individuals as found by Levenson and Besley (1996).

In their model, rosca participation was positively related to a woman's bargaining position in the household, as measured by her contribution to household income. They argued that husbands tended to prefer status-enhancing current consumption to saving for household items and school fees. They demonstrated that if men have a greater preference, relative to women, for present consumption than saving for an indivisible good, then women were better off if they saved in a rosca than at home. Essentially, roscas provided a forced savings mechanism that the woman could impose on her household and thus help to increase the household's saving rate. The household could be willing to purchase the indivisible good *ex post*, when the wife returned home with the pot, even in those cases where, *ex ante*, it was not willing to save at all.

Gugerty (2007) gave several reasons why intra-household conflict cannot fully explain Rosca membership. First, if household conflict drove rosca participation and women were unable to exert control over their own income, it also seems plausible that men would simply not allow their wives to join Roscas. Moreover, it was not clear what would prevent the husband from demanding the money once the

wife has received it. Anderson and Baland argued that once the lump sum is accumulated, the husband preferred to spend it on indivisible items. If this was the case, then husbands could suffer from time-inconsistency and use their wife's participation as a commitment strategy.

The structure of the Roscas in Gugerty's sample also indicated that participants were not seeking primarily to hide money from spouses. The meetings were always held at the home of the person receiving the pot. Fifteen visitors are likely to be noticed in a small community: the host's spouse and all her relatives are therefore aware that she has received funds. A more conducive structure for hiding funds might be to randomly select a participant to receive the money at each meeting (which none of the roscas did).

Niger-Thomas (1995) observed that husbands are often supportive of their wives' membership in Roscas and often contribute for payments. In Gugerty's sub-sample of 102 Rosca participants taken from the Kenya sample, 41 percent reported that their husband gave them money for their Rosca contributions; the total amount given over the course of a round averaged Ksh.750 (U.S. \$15). Many women also gave money to their husbands after they had received the pot. Forty-eight percent of participants gave their husband funds, on average giving them Ksh.716 (US \$14). This indicated that participation in Roscas is often a household strategy, rather than a mechanism used to keep funds away from husbands. According to her, even if roscas could be a tool for helping secretive partners to hide money, their figures did not suggest it was a device used to hide money from the spouses. Their study



suggested, as Anderson and Baland (2002) also noted that essentially, Roscas provide a forced savings mechanism for the household.

### **Substitute for insurance**

Another motive for joining a rosca is that such an association can act as a substitute for insurance particularly in settings where formal markets for insurance are virtually non-existent. The ability to bid on the pot provides an explicit insurance mechanism because participants can access money when they need it. Klonner (2000) shows how risk-averse participants in a bidding Rosca can insure themselves against idiosyncratic risks. Geertz (1962) argues that if one is the victim of a sudden misfortune, say theft, or illness, one can always persuade the other members to allow one to take the pool out of turn, an aspect of the association also important in the villages.

Calomiris and Rajaraman (1998) show that in Indian roscas , with concurrent bidding, the actual amount received by the winner is subject to variation through the bidding process in a manner consistent with insurance. Gugerty (2007) showed that individuals do not join Kenyan roscas for explicit insurance but may use the rosca institution to provide limited implicit insurance when they suffer a negative shock.

The inflexible order of rotation adopted by most roscas in her sample made it difficult for participants to access funds when they needed them; these roscas did not appear to supply explicit insurance to participants. No rosca in that sample allocated the pot by bidding. Moreover, the order of allocation is determined before the rosca begins in almost all roscas. But even if roscas do not provide explicit insurance

against idiosyncratic shocks, roscas might nonetheless provide implicit insurance if individuals are able to delay or forego payments.

Udry (1990) showed how credit contracts in Nigeria provided state contingent insurance: the timing of repayment depended on the realization of random production shocks for both borrower and lender. Platteau (1997) argues that roscas which use the needs of participants to determine the order of allocation (but do not compensate late receivers with interest) are in effect providing insurance in the form of income redistribution from those with later positions to those with earlier positions.

There are several ways in which roscas could provide implicit insurance. First, roscas could allow members some say in when they receive the funds, as occurs in roscas with a “negotiated” order of allocation. Second, roscas could allow members to switch places after the order has been determined. Third, roscas could allow for some kind of state-contingent payment, allowing individuals longer to make payments if they received a negative shock. Fourth, roscas may forgive members a payment if they receive a negative shock. Finally, rosca participants may make side deals outside of the rosca.

Dagneliev and Boucher (2008) supported this argument with their findings from Benin where they argued that Roscas can also provide insurance by offering loans to their members. Indeed 20% of all roscas offered this possibility in their rules. In the vast majority of those associations (94%) a loan could only be offered to a member who had not yet received the pot. In addition, conditions were often imposed (72%

of these groups) as for what reasons the loan could be granted (disease, financial problems, funerals, accidents, etc.) regularly solicited in groups offering this opportunity: during the last six months 58% of them granted at least one loan.

This insurance aspect was enhanced for roscas based on meeting-to-meeting decision. A member to whom something unexpected happened and who had not yet received the pot could come to a meeting and formulate her demand. For roscas fixing the entire ordering before the cycle begins, the insurance they provided was limited. It could only take into account foreseen or potentially known shocks. For instance, they could take into account harsh fishing seasons and make pot reception for fishermen coincide with it.

Sandsor (2010) argues that the rosca is able to provide insurance by allowing members to receive the pot earlier than their receipt date in the case of need. In order for the rosca to serve this purpose, the recipient must still be waiting for his receipt date. This gives an incentive for members to have a late receipt date if they consider it possible that they will have an urgent need for the pot at some point during the rotation. If the timing of uncertainty is known, rosca members want to receive the pot in the period where they have increased uncertainty in order to smoothen consumption. This gives a scope for members with heterogeneous risk profiles to join together in a rosca.

She argues, however, that if the timing of uncertainty is unknown and members have heterogeneous risk profiles, members with high income risks might want to have late receipt dates because they consider the insurance motive to be more relevant than

the early Pot motive. In this case, members differ in their valuation of receipt dates. Members can also be heterogeneous in their valuation of the indivisible good. One way of sorting these unequal valuations is to use a bidding rosca to decide the order of receipts, where the bid corresponds to each period's contribution. Members with low risk profiles and high valuations of the indivisible good will be willing to offer high bids to be early recipients of the pot. Rosca members in a bidding rosca are able to realize gains from trade between heterogeneous individuals that would otherwise not have been realized in a fixed contribution rosca.

Kibuuka (2006) argues that insurance provision of roscas is through a network of exchanges between participants based on the principle of reciprocity. He argues that a loan or a gesture in kind from a member to another puts the beneficiary under obligation to pay back when the other is in need.

### **Hiding money from spouses**

In Benin, Dagneliev and Boucher (2008) observed that regarding money matters, secrecy is the rule between spouses. An important proportion of women and men with whom they spoke declared that their spouse was unaware of the course of their occupational activities and was therefore unable to guess their income. In Benin, social norms determined the intra-household allocation of expenses by gender. The majority of the contributions to the household's public goods devolve on the husband who had to take care of everything related to the house (rental fees, repair costs, electricity), give money for housekeeping, pay the school fees, clothing, etc. His wife was to take care of the family, cook and pay water bills. In general, the

male income was not sufficient to cover the needs of the family, so that the wife had to spend more for the household than what had been allotted to her.

As long as the basic needs of the family are fulfilled, 'selfish' individuals would prefer to spend more on private goods, the utility of which is superior. Each spouse therefore tried to depart from the status-quo expenses, by passing on to the other some share of their common burden. They then entered an infinitely repeated non-cooperative game in which they tried to lower their contribution to the provision of the public good as it was detrimental to their own consumption of private goods.

In order to implement this strategy, both spouses hid their income and tried to give their partner a blurred image of their earnings. This implied that husband and wife also hid as much as they could their expenses which could lead their partner to have a guess at their revenues. Were agents able to know their partner could spend more for the household, they would claim to pay less. Therefore, none of the spouses got incited to reveal the true amount. Secrecy prevented the household from benefitting from efficiency gains usually reachable with the repetition of the game. In this case, as neither incomes nor strategies were observable, detection of fraud or deviation from a cooperative agreement was in fact rendered impossible.

Both spouses had no incentives to reveal their real income or personal expenses - which could lead to rough estimations of their earnings. Dagneliey and Boucher (2008) observed that these behaviours are widespread and accepted to such an extent that few tried to break this tacit rule and inquire about their partner's income. A selfish spouse would thus individually decide whether or not to join a rosca. Rosca participation was not a gender issue in Benin.

Anderson and Baland (2002) also support this view with their evidence from Kibera, Nairobi. They also cite studies by Mayoux and Anand (1995) who argue that in South India, roscas play an important role in increasing women's control over resources which they can use to increase assts of the family especially in cases where men were spending all their income on alcohol and gambling. They also quote other studies giving similar rationale for female participation in roscas in Indonesia and Bangladesh and (Hospes, 1995, Niger-Thomas 1995, Goetz and Sen Gupta 1996) where women are able to have control of resources and bring them to the family without alerting male household members.

### **Commitment device against self control problems**

Another motive for Roscas has also been stated as a commitment device against self-control problems. Gul and Pesendorfer (2001 and 2004) present a dynamic consistent preferences explanation of a phenomenon where agents might prefer to commit themselves and limit the set of options available to them. This phenomenon is known as temptation theory. According to their theory, agents undergoing short term temptations in conflict with their long run self interest would be 'unambiguously better off when ex ante undesirable temptations are no longer available' (Gul and Pesendorfer, 2001,). And even if they do not expect to succumb to the temptation in the future, individuals with self-control problems will expend resources to remove tempting alternatives from their choice sets arises from a desire to avoid temptation rather than from a change in preference

The second approach, departs from the dynamic consistent preferences hypothesis and corresponds to a reversal of preferences when the date of decision-making approaches. It appears from psychological experiments that people tend to have present-biased preferences - the shape of which is roughly hyperbolic - and discount time at a non constant rate - higher in the very short than in the longer term. An individual having self-control problems and being sophisticated -aware of the problem and its consequences - would prefer to commit herself. Her current self may want to restrict the choice set available to her future selves to overcome such time-inconsistencies.

Even if the underlying motives are slightly different according to each of the two theories presented above, their implications appear similar in terms of rosca participation.

Roscas seem indeed to respond to a need of commitment against one's time inconsistency preferences and temptations. Gugerty (2007) further argues that, in the absence of alternative commitment savings strategies, people having self-control problems and being sophisticated turn to rosca since they would indefinitely renegotiate with themselves if trying to save money on their own. This is supported by empirical evidence from a randomized control methodology study in the Philippines. Ashraf et al. (2001) showed that poorly educated individuals with hyperbolic preferences were more likely to join rosocas. Besides rendering the current savings illiquid and safe, rosocas restrict the set of future options as long as the end of the cycle is not reached, compelling the individual to go on saving.

Empirical evidence by Dagneliev and Boucher (2008) suggest the need of a commitment device as a motive for membership. Indeed 89% of the rosca members in their sample (198 out of 222), answered that they joined a rosca to discipline themselves to save. Moreover 60% of rosca members preferred to receive the pot at the end of a cycle. Of all those who preferred being at the end, 78% said it was because they did not want to feel indebted towards the group. Such debt aversion certainly confirms the incentive and disciplining role of the group which is exerted through pressure from the peers towards a defaulting member.

Ambec and Treich (2007) formalized the idea that roscas may be viewed as a commitment device which helps people to cope with their own self-control problems. They introduced a model whereby people want to avoid spending too much money in the future purchase of a superfluous good. One way to avoid this future purchase is to commit in advance to contribute a fixed and inflexible amount at regular dates. This commitment device simply enables participants to decrease the available income that can be devoted to this purchase. They argued that the durable good and the self-control hypotheses do not have to be mutually exclusive but may well complement each other. They gave an example of the attitude of a rosca member when he has just received the pot. If he faces severe self-control problems, he may be tempted to splurge all this money on superfluous goods. This may explain why rosca members sometime commit in advance to buy an observable lumpy durable good with the pot. This commitment is often part of the deal as was noted by Gugerty (2000) that Rosca members might go so far as to monitor or supervise the



purchases of the person receiving the pot, or to purchase it in kind for that person rather than giving him the cash.

### **Socialisation**

Sandsor (2010) argues that meeting to socialize is, clearly, another example of the social role that a rosca can play. The social gain from joining a rosca need not only be friendship. Roscas can contribute to members' reputation and network, as well as being a source of information and help beyond the economic help that roscas provide.

The obligation on members of a rosca to meet to pay their contribution may provide justification, structure and discipline to their social gatherings. But because the social element is elaborated, and because its expense may even account for a significant part of the funds collected, we should not overlook the fact that socializing may have a cost-effective benefit. Ardener, (1995) argues that members may receive considerable economic returns apart from rosca cash. From other members they may get valuable information on a wide range of topics, advice on many issues or unpaid labour, and so forth.

Kibuuka (2006) found that among the higher income groups in South Africa, social interaction was the main aim of participation in roscas.

### **2.6.3 Characteristics of rosca participants**

The socio-economic, psycho-socio and demographic characteristics of rosca participants which have been identified in the literature are include the following:

### **Household size**

Anderson and Baland (2002) observed that rosca participants do tend to have higher expenditures, larger households, more children,

Varadharajan (2004) observed that household size and its square were highly significant in determining participation in roscas. The turning point was about 12 household members – which suggest that up to 12 household members, participation in an *arisan* increases and subsequently declines.

Kedir (2011) observed in Ethiopia that household size was negatively related to the probability of participation in roscas. He argued that larger households were likely to be income poor and hence lacked the means to participate in roscas.

### **Age**

Anderson and Baland (2002) observed that rosca participants in their sample were slightly older. The age of individuals was significantly related to the probability of joining a rosca: the relationship is concave and begins to decrease at 35 years of age.

Varadharajan (2004) also observed age of the respondent and its square was highly significant suggesting that as the individual gets older he is less likely to participate in the *arisan*. The turning point in his sample occurred at about 39 years of age. He further observed that the age of the household head and its square had a significant effect on the participation of other individuals in the family, with the turning point occurring around 49 years. As the age of the household head initially increases, other individuals are less likely to participate in the *arisan*. As the head of the household becomes older, household members are more likely to participate in the *arisan*.

Dagneliey O. and Boucher P. L. (2008) also observed an inverted U relationship between age and income with the maximum reached at 46. They attributed this to the fact that demand for indivisible items increases among the young agents but decreases once they grow older. Camerer and Nguyen (2009) argued that roscas also seem to attract a younger population. This result supports the hypothesis that roscas may function as a saving device that allows agents to purchase durable and expensive goods while they are of working ages (Levenson and Besley, 1996; Besley and Levenson, 1996). Loan recipients are also less likely to join roscas. This finding suggests that roscas may substitute for loans in places where it is hard to gain access to formal financial institutions (Tanaka, Camerer and Nguyen, 2009).

Kibuuka (2006) observed that in South Africa, the majority of participants were (73.4) were in the 31-49 age category while only 13.3% and 10.7% were in the 26-30 and 50-60 age categories respectively. This, he argued was a confirmation of the life cycle hypothesis that the middle age category saves their income for their old age.

Kedir (2011) observed that in Ethiopia age had a quadratic relationship with membership in roscas; results which he stated reflected that the young have a lower demand for indivisible goods compared to the elderly.

Malkamaki and Johnson, 2009) observed a significantly high participation in rosca rate for respondents between the ages 25-45.

### **Proportion of wife's contribution to household income**

Anderson and Baland (2002) observed that the female's share of that income as the most important determinant of participation in roscas. They developed a theoretical model, which they empirically tested, where rosca participation is positively related

to a woman's bargaining position in the household, as measured by her contribution to household income. Their model predicted that when a woman's decision-making power, is very high, the household savings decision does not differ much from her own, and she will not join the rosca.

Dagneliey O. and Boucher P.,L. (2008) found no significant relationship between female share of household income and participation in roscas. They attributed this to the argument that participation in roscas is an individual decision and is not dependent on marital status consideration.

Raccanello et al (2009) found out that when a person is married and a man contributes more to the household income women tend to participate less in roscas. They attributed this to greater financial stability in the household economy and familial relations.

### **Income**

Nguyen (2010) observed that the participant's income levels as well as its relative to the village's mean income have a positive impact on rosca participation.

Levenson and Besley (1996) show that rosca participation increases with income i.e., richer individuals are more likely to participate in roscas. Individuals gained different types of social capital (e.g. information, social contacts) from different roscas since social capital is a function of the people involved in the group. Moreover, all three types of *arisans* (the religious *arisans* and the women's associations) are known more for a social role than a financial role. Furthermore, in every type of *arisan*, participation rates by spouses are greater than that of the heads.

Handa and Kirton (1999) also observed an increase in participation with income. They hypothesized that higher income individuals may be participating in roscas due to the large transaction costs that they might incur in the formal financial market.

Platteau (2000) argues that traditional solidarity networks usually pressure well-to-do households to provide financial support to their less fortunate relatives. Under these circumstances, rosca participation can be viewed as a way to resist these demands in a socially acceptable way or to reduce the risk of theft by rendering savings illiquid. As such, income is expected to positively influence participation in roscas.

Anderson and Baland (2002), however found out that in their sample, the general wealth level of the household was insignificantly related to rosca participation.

Varadharajan (2004), however, gives an alternative explanation of the inverted U shape that at lower levels of income, individuals do not earn much beyond subsistence level consumption for them to participate in roscas. Given the fact that contributions are a significant proportion of per capita expenditure, and that default is very much frowned upon, low income individuals may actually be deterred from participating. As the income earning potential increases, they are able to participate in roscas. At high incomes, they no longer need the roscas for the financial reasons and may seek other financial institutions to meet their credit requirements. He gives various reasons why the rich participate in the rosca rather than going to a formal institution. One reason could be that the social sanctions that are in place to prevent default are very strong. Thus, the poor are deterred from participating. Another reason is that roscas can possibly undertake screening and sorting of its members

thus excluding the poor, who may not have adequate disposable income. The richer individuals may participate in the rosca due to the flexibility it offers in terms of selecting the contribution rates, membership etc. These, he argued, are possible reasons to explain the upward sloping relationship between rosca participation and income.

Varadharajan (2004) further argued that though a positive relation exists between rosca participation and income was observed, income and rosca participation were possibly endogenous. This may be the case if roscas give rise to profitable opportunities that increase income. Thus, individuals may become better off by participating in roscas. He concluded that that roscas are not targeting instruments that can help alleviate people out of poverty. Moreover, he concluded that the rosca is a substitute for formal finance for the upper and lower income class groups, while it plays a complementary role in the middle class.

Dagneliev O. and Boucher P. L. (2008) also found that in Benin participation in roscas increases with income. Raccanello et al (2009) however observed that female participation in roscas was negatively related to income for females but positively related to income for males.

Levenson and Besley (1996) observed in their study in Taiwan that participation in roscas was highest among high income households which was an indication that that roscas may be an alternative saving device to the formal financial sector.

Kibuuka (2006) observed that among the higher income groups of South Africa, the higher the income the higher the probability of participation. He argued that disposable income rises with wages and hence the ability to participate in roscas.

## **Gender**

Anderson and Baland (2002) noted that the participation rates of women in roscas in a low-income area of Nairobi are higher than for men. An overwhelming majority of rosca members were women: 84 percent these female rosca participants were typically married and earned an independent income. In Kibera the probability that a woman participates in a rosca is 40 percent. If she lived in a couple, this probability rose to 53 percent, while it fell to 25.3 percent if she did not live in a couple. When she was working, her participation rate increases to 68.5 percent and to 74.4 percent if she simultaneously lived in a couple. The participation rate for men was 10.1 percent, for working men 12.4 percent, and for working men living in a couple it is 9.6 percent.

Varadharajan (2004) found that about 71% of participating individuals in Indonesia were women. He explained several reasons why women are more likely to participate in a Rosca. One of them is that women have less collateral and hence are less able to borrow from banks. It could also be that women rely on the rosca as a social network more than men. Female headship had a positive and significant effect on participation. He attributed this to the fact that females are more likely to be in need of both the financial services of the rosca and the social networks created by the rosca.

Dagneliey O. and Boucher P.L. (2008) observed that in Cotonou, Benin, rosca participation is not a gender issue. Their dataset showed that while women constituted 51% of the adult population, women formed only 45% of rosca members. The probability of a woman participating in a rosca was only 15% which increased to 21% if she lived in a couple and 24% if they were both working. On

the other hand, men had a probability of 19% which increased to 32% if they lived in a couple and 31% if they were working.

Kibuuka (2006) observed that generally, there was no gender bias in participation in roscas. However, when considering the 31-49 age categories which comprised of the majority of participants, 60% comprised of females.

Kedir (2011) observed in Ethiopia that gender was the most important determinant of rosca participation with females having a higher probability to participate.

Malkamaki and Johnson, (2009) observed that females participated in roscas significantly more than males.

### **Marital status**

Kimuyu (1999) noted that in a sample of 115 households in central Kenya, female-headed households were more likely to participate in roscas than are households headed by a man. Anderson and Baland (2002) observed that in Kibera slums of Nairobi being the female member of a couple was an important determinant of rosca participation.

Varadharajan (2004) found the marital status variables were both significant. If the individual was not married, she was less likely to participate in a rosca compared to being previously married (divorced, separated or widowed) while if she is married, she was more likely to participate in the rosca. He argued that a married woman has more strain on her own resources as she has to spend on maintaining the household. Hence she is likely to join the rosca. She is also more likely to be able to contribute to a rosca as she has the capacity to draw on her husband's income.



Gugerty (2007) observed that in Teso and Busia districts of Western Kenya, married women appeared no more likely to participate in roscas than unmarried women or women who were household heads. In their sample, women whose husbands lived on the same compound with them are no more likely to participate in the rosca. Women participated in the rosca at higher rates than men on average, but women with formal sector income did not participate in the rosca at higher rates than women without formal sector income.

Among married women, those whose husbands were co-resident at the home were no more likely to participate in the rosca. This is consistent with other evidence from rural Kenya.

Raccanello et al (2009) found that for men, not being married was positively related to participation in roscas

### **Ethnicity**

Anderson and Baland (2002) Native language (or ethnic identity) is also significant, thus supporting the notion that familiarity and trust foster the possibility of informal collective arrangements. Varadharajan (2004) also observed that speaking the same language as the population made it easier to participate in a rosca

Dagneliey O. and Boucher P.L. (2008) found in their study that ethnic identity is not significant in determining rosca participation. They concluded therefore that native language and ethnic affiliations are not important in participation in roscas.

### **Education**

Varadharajan (2004) observed that the educational qualification of the individual had a very significant and positive effect on participation. Relative to an individual

with no education, individuals with education were more likely to participate in the rosca and this effect increases with the level of education.

Dagneliey O. and Boucher (2008) found that education was not important in determining participation.

Nguyen (2010) on the other hand, the discount factor is found to have a significant effect on rosca participation. The lower the discount rate (the more patience) a person has, the more likely his/her participation in roscas is. The implication of this finding was that more present biased people are not necessarily more interested in joining roscas. He attributed this to different factors. First, present biased participants may not be sophisticated enough to be aware of their self control issues and thus to join roscas. Another reason for the high rosca participation of relatively less present biased agents is that roscas can simultaneously help participants achieve many goals in addition to being a commitment device (Gugerty, 2007). For instance, regardless of time preferences, people may join roscas to hold illiquid savings, to protect themselves from theft, or to have sufficient finances to make business investments in the future.

Kedir (2011) observed that in Ethiopia, those who had finished secondary school are less likely to participate in roscas. He attributed this to the limited access to employment by secondary school graduates in Ethiopia.

Malkamaki and Johnson, 2009) observed that singles participated in roscas more than those who were not single.

### **Religion**

Kedir (2011) argued that Muslims are more likely to participate in roscas than non-muslims. Muslims do not use banks as saving vehicles because they are interest

bearing contrary to the Islamic faith. They are therefore expected to participate more in roscas because roscas offer no interest. His findings in Ethiopia, however, showed that Muslims are less likely to join roscas.

### **Discount rate**

Tanaka and Nguyen (2009) found that in Vietnam, people who participate in fixed roscas are less present biased, have lower discount rates and are often aware of self control problems of saving on their own. In the contrary, time preferences are not strongly correlated with participation in bidding roscas. They argued that knowledge of motives and preferences is important before designing roscas.

### **2.6.4 Operations of roscas and Allocation decisions of the rosca pot**

Roscas are locally organized groups that meet at regular intervals; at each meeting members contribute funds that are given in turn to one or more of the members. Once every participant has received funds, the rosca can disband or begin another round. In joining a rosca, an individual agrees to a schedule of periodic payments in return for which she receives a lump-sum payment at a future date. Roscas often pay no interest and participants often have little or no control over when they receive the funds. Participants also bear the risk that other participants may not fulfill their obligations. (Gugerty, 2007)

The decision of how to allocate the funds however varies from one rosca to the other. The first person to receive the pots gets a loan from other members which he pays in installments (through the regular contributions) while the last one to receive the funds makes a saving. In some roscas all the amounts contributed are allocated while in some of them some amounts are saved in a kitty which is used to settle any

emergencies which may arise among the members of the groups. In some cases, the members buy a physical commodity for each recipient which may either be uniform for all the members or each member is allowed to make a choice of the commodity to be bought for him or her. The allocation procedure of the rosca funds determines the net benefit and therefore is an important factor in the success of the rosca (Kedir, 2011)

In the indivisible good model, (Besley et.al 1993), roscas are one-shot games and funds are allocated through one of two mechanisms: bidding or randomized allocation at each meeting. All individuals except the last improve their welfare by joining a rosca, as each receives the indivisible durable good sooner than by saving alone, but their position in the rosca is not known *ex ante*.

Gugerty (2007) found that in ninety-six percent of roscas in this sample, participants know the order of allocation of funds before the rosca payments begin, thus at the start of the rosca cycle there is no uncertainty to resolve. Moreover, in 37 percent of the roscas in this sample, the members repeat the order in which participants receive funds in each subsequent cycle. This pre-determined order of allocation suggests that these individuals join roscas for reasons beyond financing the purchase of an indivisible durable good.

Bari (1998) explains different types of allocation decisions in Pakistan which include:

#### **Need Based Allocation**

Bari (1998) explains this allocation process. Under this allocation scheme, the pot is allocated to the person that needs it the most. The problem of course is to determine the relative needs of the participants. If the information about needs is private, as it

is likely to be, the organizer and participants have to devise some method for eliciting the true information from the members (the problem of Hidden Information in information economics). It is clearly in the interest of the participants to overstate their needs to receive the Rosca earlier if there is no cost associated with overstating, or if the cost is less than the benefit from having the rosca earlier than later. Overstating their need is a dominant strategy for the participants, since they not only have to ensure that their need is reported as higher than the genuine needs of the others, but compared to the reported needs of others too. Since in equilibrium all will exaggerate their reported need, and the one who exaggerates it more will stand a better chance of getting the Rosca. This method is clearly very inaccurate in relating allocation to need. In such there is need of some additional constraints on reporting. This can be and is done in a number of ways. The role of the leader or organizer becomes very important in the need based rosca. It is usual, as with other roscas, to allow the organizer to take the first pot at the end of the first period. This is the reward for organizing the rosca, and bearing the risk of default as well. The organizer in need based roscas tends to be very well connected, entrenched and respected individuals of the community. Their position sometimes allows them to have privileged access to information that a younger or less established member of the community might not have. This allows them to estimate member need better, judge their self-revealed or reported estimates better, and make allocation decisions accordingly. It allows them to keep a close closer eye on the possibility of default as well. Bari (1998) observed in Lahore, Pakistan that the 'need' based might largely be for saving and durable goods purchase.

Gugerty (2007) argued that in negotiating the order of allocation at the start of each round, some insurance may be provided in roscas. These groups consider any negative shocks an individual has received in the preceding months in deciding the order of allocation. In a negotiated order, each member gives her preferred date of receiving the funds, gives her reasons, and the group negotiates a final order. In her sample, 23 percent of roscas negotiate the order of allocation in this manner. This allocation mechanism was, however, more common in more homogenous roscas that are likely to have better information on each other.

### **Random Allocation**

Bari (1998) argues that this is the most commonly used method for the allocation of a rosca. The first pot goes to the organizer. Each time period, from the second period onwards, names of all members who have not yet received the rosca are put in the draw. The winner of this period is no longer eligible for having his name in the subsequent draws. The drawing continues till the second last period when there are two people left who have not yet received the pot. In the last round the remaining person gets the rosca

Kedir (2011) explains a random rosca as one where allocation of the pot is based on random drawing of lots, with the winning member receiving the pool for the specific period; this process is repeated with each previous recipient of the pool being excluded from the draw until each participant has received the pool once. He observes that these are the most common forms of roscas in Ethiopia.

Alila (1993) found this method to be the most commonly used one in Western Kenya. Women balloted at the time the group came into existence thereby giving the sequence of their turns for receiving the contributions at the beginning. The new

members who join are given positions in this sequence according to their time of joining the group. However, this system was not rigid as two thirds of the members said there was flexibility of receiving the pot.

Henever (2006) defines a simple or random rosca as one where each individual contributes a predetermined fixed sum to an individual fund. The organizer receives the first pool of money and then according to a random assignment the fund rotates to a particular member at each meeting until every member has a turn to the pot. By the end of the rosca, everyone will have received, in lump sum, the total of their monthly contributions. In that sense, there is no net gain or loss for any participant.

#### **Consumer durable rosca**

Henever (2006) defines a consumer durable rosca as one in which the organizer assembles a group of people who contribute a fixed amount to the fund. Instead of rotating a lump sum of funds, however, participants receive a physical good, such as a dishwasher or a grain mill, which the group has agreed upon at the beginning of the rosca. The organizer usually obtains a discounted price for the goods in exchange for the guaranteed purchase of a certain number of goods in the coming months. Thus, participants in consumer durable roscas can attain the purchasing power necessary to negotiate goods at a lower price.

#### **Allocation through Bidding**

Bari (1998) argues that this is largely utilized by roscas run by businessmen and professional people. The group members are well known to the organizer and his role gains more importance in this rosca. He is responsible for ensuring that every member knows the dates of auctions as well as the location. It is customary for all

members to bear the cost of the meeting, over which they may have dinner (or tea, and the cost is shared by all, irrespective of attendance.

This small cost acts as an incentive to show up even when a member might not be interested in bidding in a particular period. It also keeps the process transparent and the reputation of the organizer less open to questioning. After bidding, which is usually the English 'shout aloud' type, the organizer is responsible for collecting the money from the members and delivering it to the winner. A written receipt is usually signed by the recipient and kept by the organizer. The organizer is rewarded for his effort by being given the pot at the end of the first period. As with the other roscas, he is deemed to be responsible for defaults.

Hennever (1998) explains another form of bidding whereby at the beginning of each rotation, the organizer contacts the participants who have not yet received the pot in order to obtain bids for the round. A participant's bid amount is the amount of each other potential bidder's monthly contribution that the bidding participant is willing to forgo in exchange for early receipt of the pot. The person who submits the highest bid for the rotation receives the pot. The highest bid amount for the round, therefore, translates into a discount for some of the participants: Rather than contributing the fixed amount determined at the outset of the rosca, each participant who has not yet received the pot pays a discounted amount that equals the fixed amount less the bid amount. Rosca participants who have already received the pot, however, are ineligible for the discounts in subsequent rotations and continue to pay the original amount. The combined amount generated in a particular rotation from both types of participants goes to the rotation's highest bidder.



Klonner (2000) describes two predominant types of auctions encountered. There are the so-called first-price sealed bid auction and the oral English auction. In the former, each active member submits a closed envelope with her bid. In a meeting, the envelopes are opened and the highest bid receives the pot at the price of her bid submitted. Equivalently, each active member communicates her bid to the organizer of the Rosca privately who then allocates the pot to the participant with the highest bid.

In an oral English auction, the active participants of the Rosca meet and submit successive oral bids until only one bidder, the winner, remains. Ideally English auction can be thought of as an oral as a so called button auction where each bidder presses a button in front of him as the standing bid continuously increases. A bidder drops out of the bidding process once she releases the button. The auction is over once there is only one bidder pressing her button She receives the pot at a price equal to the standing bid at the moment the last bidder dropped out.

Bouman (1995) hypothesized that bidding roscas have evolved to meet the need for greater control over the timing of the bids.

Tanaka and Nguyen observed that in Southern Vietnam, 94.1% of roscas allocated their funds through bidding while in the north 75.6% allocated by negotiation during the first meeting. They however, could not explain why one allocation method was common in each part of the country.

### **Decision roscas**

In these types of roscas, the decision of each period's allocation is made by the rosca organizer. Handa and Kirton (1999) observed that in Taiwan this was the most

common allocation criteria with 53% rosca allocated the pot this way. Based on the knowledge the rosca organizer has about the members, he/she allocates the pot with the most risky ones being put at the end of the round as a way of ensuring that they do not default after receiving the pot.

### **2.6.5 Preferred periods of receiving the pot**

The early pot motive (Besley et.al 1993) theory assumes that all rosca participants would prefer to receive the pot at the earliest possible time so as to maximize the benefits from the rosca. Receiving the pot at the beginning has a further advantage of reducing the risk of default from other members who may leave the rosca after receiving the pot.

Gugerty (2007) observed that in Western Kenya, the largest proportion of participants prefer to receive funds in the period just after the harvest. Participants felt that money received during this period was not obligated to be used for food or fees. Participants also felt they could use the money on their business or to buy food cheaply, either as stock for the household or to sell at a profit later. This preference is strongest for younger women, presumably because they have the greatest desire to purchase household items and the least need to pay school fees or buy food for a large number of children.

Older participants in her sample had higher relative preferences for receiving early in the year, when school fees are due and food stocks are low. The holiday season (October – December) was the least favored time to receive the pot; participants reported that money got “used up” in the entertaining of visitors and preparations for holiday celebrations.

According to Gugerty (2007), the valuation of one's position in the rosca depends also on the cost of "hosting" the rosca which may vary with season. Hosting a rosca during the hungry season means finding food for participants at a time when household stocks are low and food prices are high. Default rates on payments may also be higher during the hungry season because individuals have more difficulty in obtaining funds to make payments.

Her analysis showed that default rates were higher at the beginning of the year when school fees are due and the hungry season is beginning and again at the end of the year during the holiday season. Default rates were lowest during the harvest season. This explained why many participants preferred to receive funds during the harvest season.

## **2.7: An Overview of the Literature**

Though considerable empirical work has been carried out on rotating savings and credit associations, the findings cannot be generalized in explaining the structures of roscas. Some researchers have found more participation of women in roscas than men while others have found no gender influence in rosca participation. Some theorists argue that participants would prefer to receive the pot earlier while others argue that they would prefer to receive at the end of the cycle. The studies do not consider the impact of access to electronic money transfer systems and individual discount factors on rosca participation. Also ignored are the impacts of religion and ethnicity on rosca participation. Moreover, most of the available studies are dated and are not rigorous.

This study sought to fill these gaps in knowledge by conducting rigorous analysis and incorporating those variables which have been ignored by earlier researchers.

## 2.8 Conceptual framework

The study was based on the theories of participation in roscas. From the literature reviewed, it can be argued that the socio-economic characteristics of the individuals determine whether they participate in roscas or not. They also determine the motives for which they participate and also how the allocation decision of the pot will be made. The motives for participation on the other hand determine how the allocation decisions of the pot are made and also the time preferences of receiving the pot. The allocation decisions and the time preferences are also determined by the socio-economic characteristics of the individuals. This is summarized in figure 2.2:

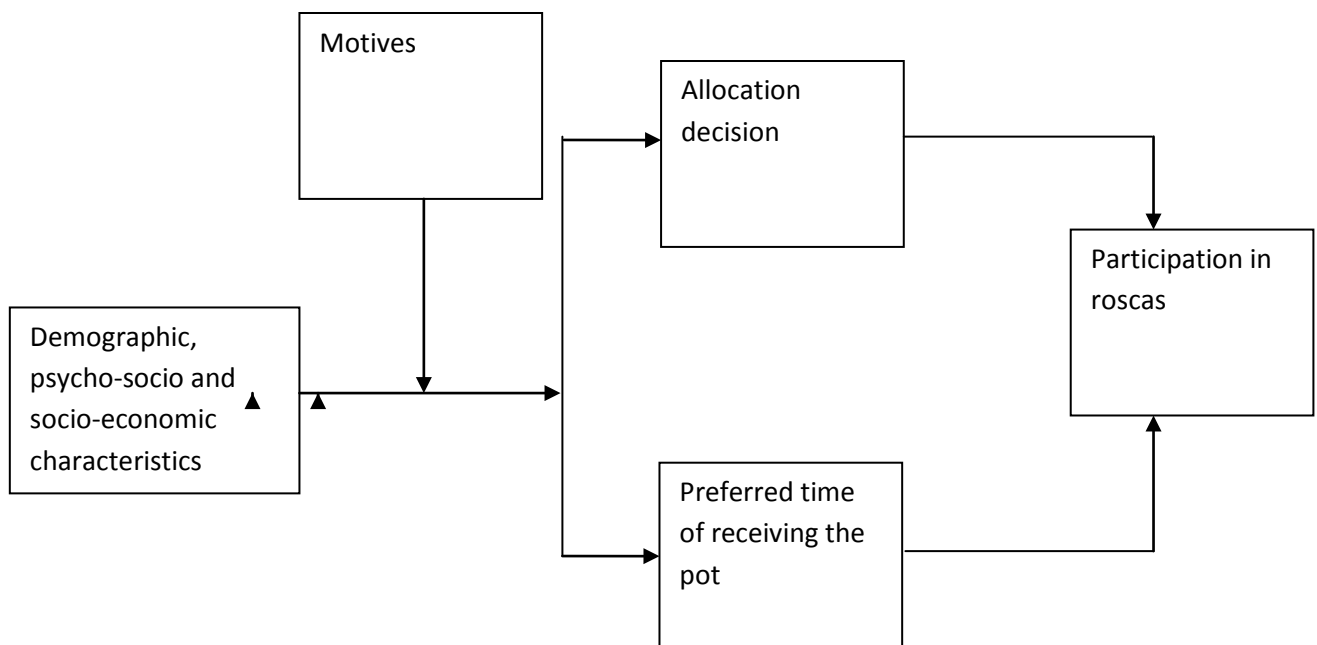


Figure 2.2: Conceptual framework

## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the methodology that has been used to design and analyze the survey data derived from the study. It includes research design, the target population, sampling and sample size, data collection procedure and data analysis and presentation.

#### **3.2 Research design**

The research design is a plan and structure of investigation so conceived as to obtain answers to research questions (Creswell, 1994). It expresses the structure of research problem- the framework, the organization, or the configuration of the relationships among variables of the study- and the plan of investigation used to obtain empirical evidence on those relationships (Adams and Schvaneveldt, 1991). In recognition of the fact that no single design exists in isolation, Sanders et.al (2003) postulate that combining different designs in one study enable triangulation and increase the validity of the findings. For this reason, two types of research design were used in this study.

First, descriptive design was used to answer objective (i), (ii), (iii) and (iv) which sought to explore the characteristics of rosca participants and the motives of participation in roscas, how the allocation decisions and the preferred periods of receiving the pot. Second, since descriptive designs do not signify causation relationships (Saunders, 2003) a cause-effect design was used to determine in a more

rigorous way the effect of the above factors on participation of roscas. Econometric techniques were used to relate the causation factors on the one hand and participation in roscas on the other. The study used both primary and secondary sources of data.

### **Secondary Data**

This comprised mainly of desk review of published information on informal finance in general and roscas in particular. It was collected from libraries and the Internet and assisted the researcher in identifying the variables targeted in the data collection.

### **Primary Data**

These were collected using a structured questionnaire. The data were collected by the researcher with the assistance of four research assistants. The research assistants were trained before embarking on the exercise. Data were collected on a wide range of variables. Data on individual characteristics include age of the respondent, levels of education, marital status, gender, occupation, ownership of mobile phone and size of their households.

## **3.3 Sampling procedure**

### **3.3.1 The Study area**

Mathare valley is referred to as the oldest and the worst slum in Africa (King, 2009). Though it is not the largest of Nairobi's slum areas, it is the most densely populated. Approximately one million people are squeezed together, living in tiny shanty-type mud huts about eight by ten feet, in an area three kilometers long and a little less than a kilometer wide. Within it live people full of frustration, resentment, anger,

fear, and hopelessness. Mathare valley is a mini-city within the city. The Mathare slums are situated a few kilometers northwest of the affluent areas of Nairobi, Kenya's capital. Its inhabitants, mainly women and children, live in small shacks about three square meters, made out of any material they can find; mud, sticks, cardboard and tin sheeting. The homes have no water, electricity, toilets or sanitation.

The slum has light industries (or *Jua-kali*), in which a person displays goods or even sets up a little business in the open air. Dressmaking and tailoring are very popular in Mathare valley along with hair dressing and kiosks (small shops), including butcher shops, vegetable stands, and small restaurants (referred to as "hotels"). Tasty dishes are served almost anywhere you walk through the Valley. Even second hand clothing and shoes are sold here. In some areas with electricity, enterprising young men have turned kiosks into video halls, where children and adults go for entertainment for a few shillings. Mathare valley commuters leave the slum very early in the morning for jobs downtown and in other parts of the city. Some are construction workers, janitors, gas attendants, cooks, domestic workers, and guards in businesses and private homes. Some work in offices, banks, churches and non-government organizations (NGOs). A few older people have even bought and sold property outside of Mathare Valley; they have land and homes in the rural areas, (King C, 2009)

The rationale for selection of this area is that being a cosmopolitan, it is likely to give a fair representation of the various ethnicities of people in Kenya. Secondly, being a slum area, the majority of the population is likely to be excluded from

formal financial institutions due to lack of title deeds and other tangible assets that can be pledged as collateral. They are therefore likely to be using informal channels of finance like roscas. Previous researchers on roscas in Kenya have ignored this slum despite it being the oldest in the country and hence there is a need to explore them.

### **3.3.2 Sampling Techniques**

A systematic sampling procedure was used. A list of the enumeration areas used in the 2009 Census was obtained. There were a total of 298 enumeration areas in Mathare location. An enumeration area comprised of an average of 100 households but ranged between 49 and 149 households. During the census, each household was given a number and this number was written on the door. Four enumeration areas were randomly selected. Each household in the selected enumeration area was visited. The research assistants employed for this purpose were those who were enumerators during the Population census. The rationale for this was that they are already familiar with the areas and the households. Data collection would thus be easier. Questionnaires were administered to household heads.

### **3.4 Data Collection procedure**

The process of implementing the survey involved a number of separate activities. These included hiring and training enumerators, pilot testing and administering the questionnaire.



### **3.4.1 Hiring and training of enumerators**

The researcher got in touch with the area chief to assist in locating the enumerators who were used in the last census. The enumerators had completed secondary school. After the recruitment, training commenced. The aim of the training was to ensure that all of them thoroughly understood the instrument to avoid interviewer errors emanating from inconsistent interpretations of questions and interview technique variability. The training process involved classroom type of teaching, exercises and role-playing to a limited extent. After the classroom work, the enumerators were taken through practice interviews to evaluate the effectiveness of the classroom work.

### **3.4.2 Pilot testing the questionnaire**

The purpose of pilot testing was to determine whether questions were properly worded and whether they would be understood by the respondents. In order to achieve this, a detailed pilot exercise was conducted to test the questionnaire. A trial interview was conducted among two respondents per enumerator. The respondents were selected in areas other than the selected ones. Any ambiguous questions were replaced before the actual data collection took place.

### **3.4.3 Questionnaire administration**

After pilot testing and replacement of the ambiguous questions, data collection commenced. The enumerators adopted the numbering of houses used during the 2009 national population census. Where households exceeded 100, the enumerators filled in questionnaires for the first 100.

### **3.5 Methods of Data Analysis**

#### **3.5.1 Descriptive statistics**

Descriptive statistics were first used to describe and compare variables meant to answer the study objectives. Descriptive analytical tools included basic frequencies, percentages and means. A cross tabulation of the various individual and demographic, psycho-social and socio-economic characteristics with membership and motives for participation in roscas was computed.

#### **3.5.2 Econometric models**

To analyze the data in a more rigorous manner showing the significance of the independent variables in affecting the dependent variable, econometric models were used. These included a probit model and multivariate logit models.

##### **3.5.2.1: Probit model for estimating determinants for participation in roscas.**

To assess the determinants of participation in roscas in, the dependent variable is a simple dichotomous variable (Y), which is a dummy equal to 1 if the respondent participates in a rosca and zero, otherwise. This situation does not allow for employment of classical regression like OLS without estimation and interpretation problems (Maddalla,1983). Therefore a binary quantitative response model was constructed to handle this leading to the choice of probit procedures that relies on normal distribution assumptions. This binary variable is assumed to be a proxy for a true underlying continuous normal distribution.

The probit procedure assumes there is an unobservable underlying response variable  $y^*$ , and that this variable can be determined by the regression relationship:

$y^* = \beta X_i + \mu_i$ , where  $X_i$  is the vector of explanatory (independent variables),  $\beta$  is the vector of parameters and  $\mu_i$  is the error term subject to the usual statistical assumptions.. Thus what is observable in lieu of the underlying response variable is the dummy variable defined by  $y=1$  if  $y>0$ ,  $y=0$  otherwise, which leads to the probit equation:  $\text{Prob}(Y=1) = F(\beta X)$ , where  $F$  is the cumulative distribution for  $\mu_i$ .

The explanatory variables were gender, age, marital status education level, income, occupation, individual discount rates, ethnicity and religion. The main hypothesis was that all these factors affect on the probability of participation in roscas.

An alternative model could have been a conditional logit model which assumes that independence of the error term. Though it is simple to estimate, it suffers from the problem if independence of irrelevant alternatives (IIA) and also one of additive separability.

Among other researchers who have successfully used the probit model in determining who are most likely to participate in roscas include Varadharajan (2004) who studied participation in roscas in Indonesia, Anderson and Baland in their study in Kibera, Nairobi, Kenya,

The vector of independent variables ( $X$ ) consist of continuous, dummy, categorical and non categorical variables The Independent variables as well as their hypothesized relationships with the probability of participation in roscas is as show in table 3.1:

**Table 3.1 Independent variables and hypothesized relationship with the probability of participation in roscas:**

Variable	Hypothesized relationship	Rationale
Age	Positive	When people are very young, they are not expected to participate much in roscas. They don't have many commitments and hence they don't need to save. They are also don't have enough money which they can commit in roscas neither do they have many trusted friends with whom they can form roscas. Older people participate more as they have many financial commitments.
Gender 0= female 1=Male	Negative	Females are more likely to participate in roscas as they may be more in need of the social networks created by roscas. It is hypothesized that men have a greater preference, relative to women for present consumption than saving for an indivisible good. If this is the case, then women are better placed to save in roscas than men. (Anderson and Baland, 2002)
Marital status 1=Single 0= Otherwise(Married, divorced/separated, widowed)	Negative	Married women are more likely to be more strained with resources and hence more probable to join roscas. They may also be able to be assisted by their husbands with resources to contribute to the roscas.
Household Size	Positive	Larger households, enjoying a high probability of having more members with regular incomes are more likely to participate in roscas as they can afford the contributions. (Kimuyu,1999)
Education level	Negative	In the absence of alternative commitment saving strategies, people having self-control problems and being sophisticated turn to roscas since they would indefinitely negotiate with themselves if trying to save money on their own. The poorly educated individuals with hyperbolic preferences are more likely to join roscas. (Ashraf,et.al. 2001)
Religion Muslim=1, 0 otherwise	Positive	Though Islamic banking has been introduced in Kenyan banks recently, Many Muslims are expected to be unaware of its existence. Since many banks do not have this facility, more Muslims are expected to participate in roscas because

		of the interest free access to finances
Discount rate	Positive	Individuals with self-control problems will expend resources to remove tempting alternatives from their choice sets. The higher the discount rate, then the higher will be the possibility of expending these resources and hence the higher will be the probability of joining roscas. Moreover, those who are present biased and hence have a high discount rate will join roscas with the aim of getting the pot earlier and hence benefiting more than if they were saving on their own.
Income	Positive	Low level income individuals, living just at subsistence level cannot afford contributions to the rosca. As income increases, they afford contributions to roscas
Proportion of wife's contribution to household budget	Positive	The proportion of the wife's contribution to the household budget is directly related to her decision-making power in the household. For a high female weight in household decision making, household savings are close to to female savings and the need for a woman to join a rosca (Anderson and Baland,2007)

### 3.5.2.2: Multinomial logit models

These were estimated to answer objectives (iii) and (iv). In a multinomial logit model, the individual is assumed to know all the mode specific attributes and to choose the alternative that maximizes his utility. The difference between the conditional logit and the multinomial logit is that in the conditional logit, the estimated regressors do not vary across alternatives while the multinomial logit allows for regressors to vary across alternatives and the observed choice is determined by the differences in utilities across alternatives. The observed choice is determined by the differences in utility across alternatives, rather than in levels of utility. This implies that the modes involve a comparison of the utility obtained from each option. A MNL model is specified as:

$$(y_i = j) = e^{\beta_{jvi}} / \sum_{j=1}^j (e^{\beta_{jvi}}) \quad j = 1 \dots j$$

Because  $\sum_{j=1}^j y_i = 1$ , a restriction is needed to ensure model identification and the usual restriction is that  $\beta_i = 0$ . While in a conditional logit values of Xs are used as derivatives from the means in multinomial logit derivations in coefficients are used to compute marginal benefits expected at alternative modes. The mode with the highest benefit will lead to participation for that mode. The utility comparison is expressed as:

$$V_{ij} = \text{pr}(V_{ij} > V_{ik}) \text{ for all } j \neq k$$

Where  $V_{ij}$  is the perceived benefit of participating in a particular mode while  $V_{ik}$  is the benefit of a particular mode  $k$  by the same individual  $i$ .  $V_{ij}$  are the benefits of participating in that individual  $j$  expects from participating in a particular mode  $j$  ( $j=1 \dots j$ ).

The multinomial logit model assumes that the disturbance terms are distributed as Weibull (Muriithi,2009). This model imposes the property of independence of irrelevant alternatives (IIA). This means that the introduction of an additional choice decreases the predicted fraction of the sample that chooses each of the original alternatives in proportion to their size before the introduction. This assumption states that there are no sub-groups within the alternatives that are closely related. Rather, all modes are independent in such a way that any introduction of an extra mode will reduce participation probabilities across all modes. The attractiveness of MNL is that it is simple to estimate, and interpret the estimated parameters

An alternative model could be a multinomial probit model. This assumes that the disturbance terms follow a normal distribution. While it removes the aspect of the IIA assumption, it has a problem that it is quite complicated to estimate. Researchers who have compared the two models (e.g. Muriithi, 2009) found no major difference in the results and hence there was no need to go to the complexities of Multinomial probit.

## **CHAPTER FOUR**

### **4.0 RESEARCH FINDINGS AND DISCUSSIONS**

#### **4.1 Introduction**

The main objective of this study was to explore the participation in roscas in Mathare Valley. It was intended to provide some insights on who are likely to participate in roscas, the motives behind such participation how allocation decisions are made and time preferences of receiving the rosca pot. The previous chapter covered the methodology employed to achieve these objectives. This chapter contains the findings and discussions of the study and attempts to answer the research questions as derived from the research objectives. It begins with providing a general description of the respondents by giving details of their socio-economic characteristics. The next section provides the results for each objective.

#### **4.2 Response rate**

The study targeted 400 respondents from Mathare Valley in Nairobi. All the questionnaires were filled as the enumerators ensured that they visited all the households in their assigned areas. However when the data was received, three questionnaires were found to have erroneous responses and were discarded leaving 397 properly filled questionnaires.

#### **4.3 Demographic characteristics of the respondents**

Females were 259 making 65% of the respondents while males were 138 making the remaining 35% of the respondents. Though the targets of the research were household heads, in some instances where the household heads were absent, the



questionnaires were administered to any other available responsible individual. Household heads comprised of 191 respondents (54%) while spouses were 163 (46%). A total of 262 (69%) respondents were married while 105 (28%) were single. The remaining 14 (4%) were either divorced or separated. Among those who were married, 242 (74%) were living in the same house with their spouses while 84 (26%) were living in separate houses from their spouses.

The average size of the households was four but household sizes ranged from one to sixteen. Catholics were 194 (51%). This was followed by Protestants who were 159 (42%) while Muslims were 19 (5%) while 8 (2%) were atheists. The sample was therefore dominated by Christians.

The mean number of years of schooling was 11 years. Those who had primary level of education (up-to 8 years) were 16% while 68% had secondary level education (9-12 years). The remaining 16% had post secondary education. This shows that the education level of the slum dwellers is quite high as most have reached at least secondary school level.

The mean age was of the respondents was 32 years. However, it ranged from a minimum age of 15 to a maximum of 103. This shows that the respondents were of the economically active ages. They indicated that they saved some income with an average saving rate of 20%. The minimum saving rate was indicated as 1% while the maximum rate was 92%. This may be an indication that slum dwellers have a potential of saving and thus the belief that such people are too poor to save may be wrong.

The average monthly income of the households was within the Ksh.5001-10,000 range while the monthly food expenditure was still within the same range. Spouses' income was also within the same range though some said that they did not know how much their spouses were earning. This concurs with Dagneliey and Boucher's (2008) argument that the spouses tend to hide their income and give only a blurred image of their earnings. Wives contributed an average of 38% of the household income with the range varying from 1% to 100%. Those contributing 100% were mainly the household heads.

Concerning occupation, the majority (41%) was involved in their own informal business, 26% were employed in private sector, 15% were in formal business, 9% were employed in the formal sector while another 9% were students. The majority of the respondents (75%) were members of roscas. They belonged to between one and six roscas. Membership to each rosca averaged 12 but ranged from between two and 150. It took an average of 98 days to complete one rosca round though this ranged from two days to 900 (three months). The amount contributed per round averaged Ksh.393 though it ranged between Ksh.20 and Ksh.3, 000. Of the contributions made, an average of 47% was saved while the rest was distributed among the members. This saving, however, ranged from 0.2% to 100%.

Table 4.1 presents means and standard deviations of the key continuous variables while table 4.2 presents frequencies and percentages of the non-continuous variables used in the analysis:

**Table 4.1: Summary Statistics (Continuous Variables)**

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Variable	No. of observ.	Mean	Standard Deviation	Min	Max
Age	396	32.30808	8.939801	15	103
Household size	395	4.050633	1.674675	0	16
No. of years of Schooling	397	11.08312	2.740575	0	18
Percentage of income saved	351	19.60969	13.40592	1	92
Number of Roscas they belong to	298	1.355705	0.7160857	1	6
Individual discount rate	361	19.6615	13.37298	0	50
Amount contributed per round	298	392.5168	462.356	20	3000
Number of members in one rosca	297	12.3771	9.331682	2	150
Days to complete one round	294	97.93197	101.0035	2	900
Percentage of contribution saved	113	47.39115	33.84259	0.2	100
Percentage contribution of wife	251	38.30279	29.63532	1	100
Monthly food expenditure	384	1.53125	0.6654961	1	4
Monthly income	347	2.37464	0.978522	1	4
Income of Spouse	272	2.941176	1.326787	1	5

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**Table 4.2 Summary statistics (Non-continuous variables)**

<b>Variable</b>	<b>Number Of observations</b>	<b>Percentage</b>
Females	259	65
Christians	343	93
Muslims	19	5
Atheists	8	2
Single	105	27
Married	262	68
Divorced/Separated	14	4
Widowe(re)d	7	2
Spouse live in same house	242	74
Students	36	9
Employed (Private sector)	100	26
Employed (Public sector)	39	9
Artisans	10	3
In formal Business	59	15
In informal business	150	38
Has mobile Phone	377	96
Subscribed to money transfer service	373	94
Has bank account	207	63
Rosca members	298	75

Key: Income levels

1=Below 5000 2=5001-7500 3=7501-10000 4= Above 10,000 5= Don't Know)

The provinces of origin of the respondents were used as a proxy for their ethnicity.

The responses were as shown in table 4.3:

**Table 4.3: Province of origin of the respondents:**

---

Province	Frequency	Percentage
Central	102	26
Eastern	78	20
Western	68	17
Nyanza	55	14
Rift Valley	48	12
Nairobi	23	6
Coast	13	3
N. Eastern	8	2

---

The majority of the respondents had originated from Central province while Eastern province was second followed by Western province. North Eastern province was the least represented. Those provinces which are near Nairobi like Central and Eastern had more respondents than those which were far away. Moreover, the distribution of the sample was a fair representation of the ethnic distribution of the country. As many of Nairobi residents have migrated from other provinces, those who originated from Nairobi were relatively few.

#### **4.4 Ownership of Mobile phones and electronic money transfer services**

The majority of the respondents (96%) own a mobile phone while the remaining 4% do not own one. Among those who do not have a mobile phone, only 40% were members of roscas while 90% of those who owned mobile phones were members.

This may imply that membership of roscas may assist members to purchase mobile phones as they are able to save through a rosca and buy one. It may also have an indication of social pressure among members to purchase mobile phones so that they can all be communicating. Among those who own mobile phones, 94% had subscribed to a money transfer service of which 81% had subscribed to M-pesa while 22% had subscribed for M-Kesho. The services for which they use the money transfer services are as shown in table 4.4:

**Table 4.4: Services for which money transfer services are used**

---

<b>Service</b>	<b>Frequency</b>	<b>Percentage</b>
Saving Money	191	56
Receiving money	77	23
Transferring money	61	18
Transacting with Bank	11	3

---

The majority of the respondents use M-pesa for saving money. This is a surprising result because the normal expectation is that the service is mainly used for transferring money. It is however consistent with behavior if rosca participants who save their money in institutions which do not offer any interest. It could be an indicator of lack of access to banking services and hence saving their money in whichever form is available. It is an opportunity which can be used by bank to further enhance their mobile banking facilities as it can be seen that the slum dwellers can and they do save.

#### 4.5 Saving Behavior of respondents

In response to whether they save money for future use, 334 respondents (86%) said they save while 56 (14%) said they do not save. This indicates that contrary to popular believe that slum dwellers are too poor to save and are un-bankable, they do in fact save. The places they save are as shown in table 4.5:

**Table 4.5 Saving devices used by respondents**

---

<b>Mode</b>	<b>Frequency</b>	<b>Percentage</b>
Bank	195	55
Rosca	64	18
M-Pesa	65	18
Home	34	10

---

The figures indicate that majority of the respondents (55%) save in banks. They are therefore banked, a surprising finding among slum dwellers. They save an average of 20% of their income with a range of between 1% and 92%. This indicates that poor people can and in fact do save. The reason for their choice of saving device is presented in table 4.6:

**Table 4.6 Reasons given for choice of savings devices**

---

<b>Reason</b>	<b>Frequency</b>	<b>Percent</b>
More secure	106	33
Its confidential	71	22
Easily accessible	66	20
Can get a loan	52	16
Can get the money easily	9	3
Can't get the money easily	21	6
<b>Total</b>	<b>325</b>	<b>100</b>

---

The table indicates that the most important consideration made in choosing a saving mode is security which accounts for 33%. Confidentiality is the second most important consideration accounting for 22% while ease of access to the mode is the third consideration (20%) Savers also consider the possibility of getting a loan from the saving mode (16%). Only a small minority consider the ease with which they can access the money with 3% preferring modes in which they can access it easily while 6% prefer ones from which they cannot have easy access to their money. The saving motivation therefore differs considerably among the slum dwellers. Some are concerned about how to commit their savings while others are concerned about access. Designers of saving institutions should therefore ensure security, confidentiality and accessibility of the institutions through opening branches close to their potential clients. They should also make loans accessible to their customers for them to be successful.

The saving devices chosen as per the reasons given are shown in table 4.7:



**Table 4.7: Reasons given per chosen saving device**

---

Mode	Easily Accessible	Secure	Can't get back easily	Confidential	Can get loan	Can get it back easily	Total
Bank	17	93	3	30	17	4	<b>164</b>
M-pesa	36	10	0	11	0	8	<b>65</b>
Rosca	6	1	5	3	35	8	<b>58</b>
Home	7	1	1	24	0	1	<b>34</b>
<b>Total</b>	<b>66</b>	<b>105</b>	<b>9</b>	<b>68</b>	<b>52</b>	<b>21</b>	<b>321</b>

---

The table indicates that those who consider ease of access as the criterion for choice of saving mode save their money in M-pesa. This is because they have their mobile phones with them always and given that there are very many M-pesa agents within easy reach, then this becomes the preferred saving mode. Those who choose banks indicated that they do so because they feel that the banks are more secure than other modes and also that there is confidentiality in banks. The majority of those who save in roscas (60%) said that they do so because it is easy to get a loan from the rosca. This confirms that access of loans among slum dwellers from formal financial institutions is a problem and hence seeking for alternative avenues for credit.

#### **4.6 Sources of credit**

A related question to this was where the respondents borrow money from if they ever do and they gave the responses shown in table 4.8:

**Table 4.8 Sources of credit for respondents**

---

<b>Source</b>	<b>Frequency</b>	<b>Percent</b>
Relatives and friends	197	53
Sacco	21	6
Banks	94	25
Money-lenders	63	17
<b>Total</b>	<b>375</b>	<b>100</b>

---

The table indicates that the major source of borrowing are relatives and friends (52%), followed by banks (25%) while money-lenders are a third source of borrowing accounting for 17% of all borrowing while 6% of the respondents borrow from Saccos. Though borrowing from roscas was not asked in the questionnaire, it is assumed that roscas were part of the relatives and friends. This confirms our earlier argument that access to credit from formal sources is a constraint to the slum dwellers hence their participation in roscas as a source of loans.

#### **4.7 Characteristics of rosca Participants**

Among the respondents 298 (75%) were members of at least one rosca while only 25% were not members. Among the members 222 (75%) belonged to one rosca, 53 (18%) belong to two roscas, 20 (7%) belong to three, two belong to 5 roscas while one belongs to 6 roscas. The incidence of participation in roscas is therefore high. A significant number of households also participate in more than one rosca.

Some 57% of all roscas allocate all the money they contribute while 43% save some proportion of the contributions which they either use to give loans to members or to assist members when in problems. Apart from meeting during the scheduled rosca meeting, 15% of the respondents said they meet very frequently, 18% met frequently, 29% often, while 37% occasionally and 2% never meet at all. Roscas therefore presents a meeting opportunity for the members whereby they can socialize and exchange information of what has been happening during the time they have not met. Roscas therefore serve multiple functions. The savings and credit function may be an outcome of appropriability of social organizations in informal settlements.

The relationship between rosca membership and demographic characteristics is shown in table 4.9:

**Table 4.9: Demographic Characteristics of rosca Members**

---

Variable	Percentage
<b>Gender</b>	
Female	74
Male	26
<b>Age Category</b>	
18-25 years	5
26-35 years	73
36-45 years	20
Over 45 years	2
<b>Province Of origin</b>	
Nairobi	5
Central	26
Nyanza	14
Western	18
R. Valley	13
Eastern	21
N. Eastern	1
Coast	3

---

The table shows the following relationships between demographic characteristics and rosca membership:

## **Gender**

The table shows that among the 298 respondents who were members of roscas, 221 (74%) were females while only 26% were Males. This conforms to findings of earlier researchers that there are more female participants than males. It supports findings by Anderson and Baland (2002) that rosca participation is more among women than men in Kenya. It contradicts the findings in Benin by Dagneliey and Boucher (2008) at females were not more than males

## **Age**

Membership to roscas is very low in the early age category at only 5%. It increases with age and reaches a maximum in the age category 26-35 which comprises 73% of the total membership and then falls progressively with age. The members who are in the age category 36-45 comprised only 20% and this falls to only 2% in the age category over 45 years.

## **Ethnicity**

The figures indicate that 5% of the members had originated from Nairobi province while 26% had originated from Central province. Some 14% had originated from Nyanza province, 18% from Western province, 13% from Rift Valley and 21% from Eastern province. Only 3% had originated from Coast province and 1% from North eastern province. This shows that only those originating from North Eastern province had little or no interest in membership of roscas.

The relationship between psycho-social characteristics and membership to rosca is presented in table 4.10:

**Table 4.10: Psycho-social characteristics of rosca members (Percentages)**

Variable	Percentage
<b>Marital status</b>	
Married	74
Single	20
Divorced/Separated	4
Widowe(red)	2
<b>Does spouse live in same household</b>	
No	21
Yes	79
<b>Religion</b>	
Catholic	52
Protestant	45
Muslim	2
Atheist	1

The table shows the relationship between psycho-social characteristics and membership to roscas as follows:

**Marital status:**

The majority of rosca participants (74%) are married while 20% are single. The divorced comprise only 4% while the widowed comprise only 2% of the members. The singles are either in school, have fewer financial commitments or have not yet

developed enough trust with many people to entrust them with their money and hence their participation in roscas is lower. One may attribute the low participation of the widowed and divorced to the fact that, the assistance of the spouse ceases when one is either divorced or widowed and hence the lower participation rate than the married. It may also be due to the low number of respondents who were in this category.

### **Spouse living in the same house**

Among the rosca members who were married, 79% were co-habiting with their spouses while 21 were not co-habiting. This may indicate that participation in roscas is a household strategy whereby spouses agree on participation and they assist each other on the contributions.

### **Religion**

The majority of rosca members were Christians, 52% Catholics and 45% Protestants as compared to only 2% Muslims and 1% atheists. Rosca participants are therefore mainly Christians, which may emanate from the teachings of the Christian faith of fellowship with one another.

The relationship between socio-economic characteristics and membership to roscas is as shown in table 4.11:

**Table 4.11: socio-economic characteristics of rosca members (Percentages)**

---

Variable	Percentage
<b>Has mobile phone?</b>	
No	2
Yes	98
<b>Education level</b>	
Primary	70
Secondary	18
Post-Secondary	12
<b>Household size</b>	
1-3	51
4-5	37
Above 5	12
<b>Occupation</b>	
Student	2
Employed	33
Formal Business	17
Informal Business	48

---

The table indicates the following relationships between socio-economic characteristics and participation:



### **Education level**

Among the respondents who were rosca members, 70% had primary school level of education, 18% had secondary school level of education while 12% had post secondary education. Participation in roscas, therefore, decreases with level of education.

### **Household size**

Among the respondents who were rosca members, 51% were from households with sizes 1-3, 37% were from household size 4-5. This falls further to 12 % for household sizes above 5. It shows that as household size increases, the amount of savings available decreases and hence the ability to participate in roscas. This could also arise from the fact that those with large household sizes are likely to be the old and hence the demands for savings for the families reduce.

### **Occupation**

The results indicate that only 2% of rosca members were students while 33% of the members were employed. Some 17% were engaged in formal business while 48% were in informal business. Roscas therefore serve mainly those in informal business. This is because these are the people who are most likely to be rationed out by the formal financial sector and therefore they seek refuge in the informal financial sector.

### **Possession of mobile phones**

Among the rosca members, 98% own mobile phones, while only 2% did not own mobile phones. It may be argued that membership to roscas have enabled ownership of mobile phones through savings and also peer pressure from the members for everyone to own a mobile phone.

### **4.8 Preferred period of receiving the pot**

When asked about their time preferences of receiving the pot, the respondents gave the responses given in table 4.12:

**Table 4.12: Preferred period of receiving the pot**

Period	Freq.	Percent
At the beginning	48	16
At the end	75	25
At the time of opening schools	76	26
During the festive season	13	4
No preferred period	85	29
Total	297	100

The results indicate that contrary to what was expected, the majority of the respondents did not prefer to receive the pot at the beginning of the period. The majority (29%) had no preferred period for receiving the pot while 26% preferred to receive at the time of opening schools. Another 25% preferred to receive it at the end of the period while 16% preferred to receive it at the beginning. Only 4% preferred to receive during the festive seasons. Though not explicitly mentioned, the fact that majority of the respondents did not have any preferred period for receiving

the pot is supportive of Gugerty's (2003) argument that roscas are used as a commitment device to saving and that they value the commitment mechanism that roscas provide rather than the value in speeding the accumulation process.

The relationship between the motive of participating in the rosca and the preferred period of receiving the pot is shown in table 4.13.

**Table 4.13: Relationship between motive of participation in rosca and preferred period of receiving the pot (Percentages)**

Motive	Preferred period of receiving pot				
	Beginning	End	School opening	Festive period	None
To save money	20	30	21	3	18
To socialize	11	20	13	0	57
To force myself to save	40	0	20	0	40
To assist me when in problems	21	13	32	8	25
To hide money from spouse	4	30	34	4	29
As a source of loans	0	50	0	25	25

The table shows that majority of the respondents who participate in roscas to save prefer to receive the pot at the end of the rosca cycle. The main reason for this could be the fear of being indebted to the other members. They therefore feel that once they join roscas, they are able to save without much temptation to use the money if they save on their own. The period which takes preference for those participating

with the motive to save is during the time of opening schools. This can be explained on the fact that many people save for a particular motive. Such people save for school fees and therefore they prefer receiving the pot during the time for school opening when fee payment is due. A third preference is at the beginning of the rosca cycle who would be saving with an intention of purchasing their goods earlier. The other group of respondents who participated with an intention to save indicated no time preferences while very few preferred to receive during festive periods implying that very few people save for leisure.

Majority (57%) of the respondents who join roscas to socialize have no preferences for the period they receive the pot. This is because their main motive is just socialization and not meeting any specific financial obligations. In this case, then they do not have any time preferences. The second most preferred period in this category is at the end of the rosca cycle. Given that they do not participate in roscas for financial reasons, then they don't want to have a feeling of being indebted to the others. The third most preferred period for those who join the roscas for socialization is during school opening periods while the fourth is at the beginning. These could be the participants who have a high economic reasoning and those who take into consideration the time value for money.

Among those who participate in roscas as a forced saving mechanism, 40% prefer to receive the pot at the beginning while a similar has no preferred period of receiving the pot. This could imply that some people, lacking self control of their expenditure but in need of certain goods, participate in roscas. Some like committing themselves by purchasing the goods in advance. Once they have received the pot in advance,

they have no option but to fulfill their commitments to the rest of the rosca participants. Others do not have any pre-arranged commitments but they participate in roscas as a way of accumulating savings. It is after receiving the pot that they decide what to do with the pot. The remaining 20% of respondents in this category prefer to receive the pot during school opening periods. Such are ones who feel that due to their lack of self-control in expenditure, they may spend all the income such that come school opening period, they won't have enough to pay school fees.

Majority of those who participate in roscas as a means of assisting them when in problems prefer to receive the pot at the time of school opening. This implies that such people see getting school fees as a a problem and hence they see roscas as a means of solving this problem. This is followed by those who have no preferred period. Such are those participants who participate for insurance as insurance. As they don't know when disaster may strike, then such people have no preferences of the period to receive the pot but when disaster strikes, they can negotiate with the other members to be given the pot then. Others know that they have people to cry to when they are in problems as rosca members are mainly friends. Third preference in this category is the beginning. Such participants are the rational ones who know about the time value for money. If roscas have arrangements whereby each member contributes a certain amount of money to assist any member who has a problem, then the more rational or risk adverse members would prefer to receive the pot at the beginning as this reduces their risks of losing their money in case some members default. It also caters for the risk of inflation. A minority in this category prefer receiving the pot during the festive season.

Majority of those who participate to keep the money away from their spouses prefer to receive the pot during the school opening periods. Such spouses are likely to be irresponsible and incapable of paying school fees. In such situations, the more responsible spouse is the one who pays school fees and hence participates in the rosca for it. Second in this category prefer to receive the pot at the end of the rosca cycle. They fear that if they receive the pot earlier, they still have the risk of losing it to their irresponsible spouses and they continue paying for it. Third are those who do not prefer any period. Given that their aim is to keep it away from their spouses but they are not saving for any specific item, then they have no preferences for the period to receive it. The minority prefer receiving the pot either at the beginning or during festive seasons accounting for 4% each period. This is a reflection of the fact that they are neither saving for financial gains nor for wasteful consumption.

Half of those who participate in roscas as a source of loans prefer to receive the pot at the end of the cycle. This could reflect the fact that once such people take loans from the roscas, as they will be repaying the installments, if they receive the pot early, they will be repaying the agreed installments and at the same time they will feel as if they are again indebted to the other members whom they have to repay the pot received. In such situations, they may feel that they have two loans. The other half equally prefers to receive the pot either during festive periods or have no preferred period. Those who prefer the festive period could be the poorest of participants who have no savings and as they would like to enjoy like any other person during the festive period. Having no other avenues for savings, then they join roscas. Those who have no preferred period are also those not interested in the pot

per se but would like their money to remain in the rosca as collateral for loans which they take from the roscas.

Asked their reasons for preferring the mentioned periods, the responses given were as shown in table 4.14:

**Table 4.14: Reasons for preferring the mentioned periods**

Reason	Freq.	Percent
Don't want to be indebted	76	35
That's when needs for money are more	74	34
I benefit more	69	32

All the reasons for period preferences had almost similar percentages though not wanting to be indebted had a slightly higher percentage. Need for the money at that preferred period was the second most important criteria for selection of the preferred period. Surprisingly, personal benefit was the least factor in order of importance for preferring a particular period of receiving the pot. This may suggest that roscas are not meant mainly as economic institutions. In other words, roscas are outcomes of organizations that have been appropriated for rosca purposes but also play multiple roles.

A cross tabulation of the reason per preferred period is shown in table 4.15:

**Table 4.15: Reason for preferred period (Percentages)**

Period	Reason		
	I benefit More	don't to be indebted	its when I need it most
At the beginning	81	8	10
At the end	11	85	4
At the time of opening Schools	22	9	68
During the festive season	0	7	93
Total	<b>32</b>	<b>35</b>	<b>33</b>

The table shows that those who prefer receiving the pot at the beginning do so for personal benefit. The ones who prefer to receive at the end do so because they don't want to be indebted while those prefer the time of opening schools or during festive season do so because that is when they need the money most. Participation in roscas can therefore be said to be need-based. People participate in them to save money for a particular need. These results contradict Gugerty's findings on the one hand as her respondents did not prefer to receive the pot at the beginning of the school term as they argued that all the money would be used up in paying school fees. Both studies however agree that the least preferred season is the festive season.

Table 4.16 shows the relationship between demographic characteristics and the preferred period of receiving the pot:



**Table 4.16: Relationship between Demographic characteristics and preferred period of receiving the pot (Percentages)**

Variable	Preferred period of receiving the pot				
	Beginning	End	School Opening	Festive period	No Preference
<b>Gender</b>					
Female	18	25	25	3	29
Male	10	25	29	8	29
<b>Age Category</b>					
18-25 years	27	33	7	13	20
26-35 years	17	24	26	3	30
36-45 years	12	26	30	7	25
Over 45 years	14	7	0	0	29
<b>Province of origin</b>					
Nairobi	7	53	7	0	33
Central	13	21	30	5	30
Nyanza	15	27	24	2	7
Western	21	13	23	9	34
Rift Valley	19	35	24	3	19
Eastern	16	27	29	3	24
N. Eastern	0	67	0	0	33
Coast	38	13	38	0	13

The table shows the following relationships between demographic characteristics and preferred periods of receiving the pot:

### **Gender**

Among the female participants, (18%) preferred to receive at the beginning of the period, 25% at the end, 25% during the period of opening schools, 3% during festive periods while 29% had no preferred period. Among the male participants 10% preferred at the beginning, 25% preferred the end, 29% when schools are opening, 8% during festive periods while 29%, had no preferred period. Males shoulder the burden of education. However the early pot motive hypothesis is not upheld by this study.

### **Age**

In the 18-25 age category, 27% prefer the beginning, 33% prefer the end, 7% during school opening period, 13% during the festive period, while 20% have no preferences. In the 26-35 age category, 17% prefer the beginning, 25% the end, 26% during school opening period, 3% during festive periods, but 30% are indifferent. The 36-45 age category had 12% preferring the beginning, 26% the end, 30% during the school opening period, 7% during festive period while 25% have no preferred period. The over 45 years category had 14% preferring the beginning, 57% preferring the end, and 29% with no preferences. Majority of the old, with less needs, less education and possibly lower discount rates thus prefer the end of the period.

## **Ethnicity**

The figures indicate that 7% of the respondents who had originated from Nairobi province prefer the beginning, 53% prefer the end, 7% prefer the school opening period while 33% have no preferred period. None prefers during the festive period, Among those from Central province, 13% prefer the beginning, 21% prefer the end, 30% during school opening period, 5% during festive period while 30% have no preferences., For those who originated from Nyanza province, 15% preferred the beginning, 27% prefer the end, 24% the school opening period, 2% during festive period but 7% have no preferred period Concerning those from Western province, 21%, prefer the beginning, 13% the end, 23%, during school opening period, 9% during festive period while 34% have no preferred period. Rift Valley had 19%, preferring the beginning, 35% the end, 24% during school opening period, 3% during festive period while 19% have no preferences. For those who had originated from Eastern province, 16% preferred the beginning, 27% the end, 29% during school opening period 3% during festive period while 24% have no preferred period. Among those who had originated from North Eastern province, 67% preferred the end and the remaining 33% had no preferences.

For those who originated from Coast province, 38% preferred the beginning, 13% the end 38% during school opening periods while 13% had no preferred period. Generally, most respondents prefer to receive the pot during school opening periods so that they can use it to underwrite the education of their children.

The relationship between psycho-socio characteristics and preferred period of receiving the pot is as shown in table 4.17:

**Table 4.17: Relationship between Psycho-socio and preferred period of receiving the pot (Percentages)**

Variable	Preferred period of receiving the pot				
	Beginning	End	School Opening	Festive period	No Preference
<b>Marital status</b>					
Married	12	25	27	5	30
Single	27	24	17	2	31
Divorced/Separated.	9	55	36	0	0
Widowe(red)	40	20	20	0	20
<b>Hoese spouse live in same house?</b>					
No	9	35	33	4	20
Yes	16	24	24	5	31
<b>Religion</b>					
Catholic	17	20	27	6	30
Protestant	15	27	24	3	27
Muslim	17	17	17	0	50
Atheist	50	50	0	0	0

The table shows the following relationships between psycho-social characteristics and preferred periods of receiving the pot:

### **Marital status**

The results indicate that 27% of the married respondents prefer to receive the pot at the beginning, 54% at the end, 27% when schools are opening, 5% during festivities while 30% have no preferences., Among the single, 27% prefer the beginning, 24% the end, 17% during school opening while 31% have no preferred period. For those who were divorced or separated, 9% preferred the beginning, 55% prefer the end, while the remaining 36% prefer when schools are opening. Among the widowed 40% prefer the beginning, 20% prefer each of the end and during school opening period, another 20% have no preferences while none preferred during festive periods. Among the married, 9 % of those who were not residing in the same house with their spouses prefer the beginning, 35% prefer the end, 33% the school opening period,4% the festive period while 20% have no preferences. Those residing in the same house with the spouse, have 16% preferring the beginning, 24% preferring the end, 24% when schools are opening, 5% prefer during festive periods while 31% have no preferences.

### **Spouse living in the same house**

Among the households where the spouses are co-habiting, 31% have no preferences of when to receive the pot, 24% prefer at the end and a similar percentage prefer when the schools are opening, 16% prefer the beginning while 5% prefer the festive periods. On the other hand, where the spouses are living separately, 35% prefer the end while 33% prefer the school opening period, 20% have no preferences, 9% prefer the end while 4% prefer the festive periods. Spouses living separately are

therefore more risk averse and therefore would not like to be indebted either to their colleagues or to schools where their children are learning.

### **Religion**

Concerning the relationship between religion and the preferred period of receiving the pot, 17% of Catholics prefer the beginning, 20% prefer the end, 27% during school opening period, 6% during festive period while 30% have no preferred period. Among the Protestants 15% prefer the beginning, 27% the end, 24% during school opening, 3% during festive period while 27% have no preferences. Regarding Muslims 17% preferred each of beginning, end and during time of school opening while 50% had no preferred period. None of them preferred during festive periods. Half of atheists (50%) preferred the beginning while the other half preferred the end.

The relationship between socio-economic characteristics and preferred period of receiving the pot is shown in table 4.18:

**Table 4.18: Relationship between socio-economic characteristics and preferred period of receiving the pot (Percentages)**

Variable	Preferred period of receiving the pot				
	Beginning	End	School Opening	Festive period	No preference
<b>Do you have a mobile Phone?</b>					
No	17	50	17	0	17
Yes	16	24	25	1	29
<b>Education level</b>					
Primary	7	30	19	4	41
Secondary	18	23	30	5	24
Post-Secondary	14	34	17	3	31
<b>Household Size</b>					
1-3	23	3	11	41	22
4-5	14	21	27	3	34
Above 5	5	32	30	8	24
<b>Occupation</b>					
Student	33	17	50	0	0
Employed	7	38	27	7	23
Formal Business	19	31	23	4	23
Informal Business	20	17	25	3	4

From the table, the preferred period for receiving the pot per socio- economic characteristics indicates as follows:

### **Possession of mobile phones**

Among those who own mobile phones, 17% prefer the beginning, 24% prefer the end 25% prefer when schools are opening 1% prefer during festive periods while 29% have no preferred period. Half (50%) of those who have no mobile phones prefer to receive at the end while 17% prefer each of the beginning and during the period of paying school fees. A similar percentage has no preferred period.

### **Education Level**

Among the respondents with primary level education, 7% preferred the beginning, 30% the end, 19% during school opening period, 4% during festive period while 41% had no preferred period. For those with secondary education 18% preferred the beginning, 23% the end, 30% during school opening, 5% during festive season while 24% had no preferred period. For those with post-secondary education, 14% preferred the beginning, 34% the end, 17% during school opening period, 3% during festive period while 13% have no preferred period.

### **Household size**

Among the respondents with household sizes 1-3, 23% prefer to receive the pot at the beginning, 3% the end, 11% during school opening periods, 41% during festive periods while 22% have no preferences For those with household size 4-5, 14% preferred the beginning, 21% the end, 27% during school opening periods, 3% during festive periods, while 34% have no preferences. Regarding household sizes



above 5, 5% prefer the beginning, 32% prefer the end, 30% when schools are opening, 8% during festive periods while 24% have no preferences. The ones who have very small household sizes, because they don't have much commitments use the money mainly to enjoy themselves and hence their preferred period of receiving the pot is during the festive periods.

### **Occupation**

The results indicate that 33% of students prefer to receive the pot at the beginning, 17% to prefer the end and the remaining 50% prefer the school opening periods. Among the employed, 7% prefer the beginning, 38% at the end, 27% during the school opening period while 23% have no preferences. For those engaged in formal business, 19% prefer the beginning, 31% prefer the end, 23% prefer the school opening period, 4% prefer festive period but 23% have no preferences. For those in informal business, 20% prefer the beginning, 17% prefer the end, 25% the school opening period, 3% the festive season, while 4% have no preferred period.

In summary, 22% of the respondents prefer to receive the pot at the beginning of the cycle, 35% at the end, 35% during school opening periods while 6% were indifferent. An equal proportion of males and females (29%) had no preferred period of receiving the pot, and an equal proportion (25%) preferred to receive it at the end of the cycle. More males, however, preferred to receive the pot during the school opening period than females. This could be due to the fact that in most cases it is the responsibility of men to pay school fees. Majority of the married (54%) prefer to receive the pot at the end of the cycle. Half of Muslims have no preferred period for receiving the pot compared to 30% of Christians who have no preferred period.

Regarding education level only 7% of participants with primary school level of education prefer to receive the pot in the beginning of the rosca cycle compared to 18% of those with secondary school level of education and 14% of those with post-secondary school level of education preferring the same period. Being more rational, therefore, the educated may see roscas as economic entities. After attaining some level of education, however, social motives for participation in roscas outweighs economic ones.

A reasonable number (41%) of participants with household sizes 1-3 prefer to receive the pot during festive periods. This is a contrast to 3% of those with household sizes 4-5 and 8% for household sizes over 5. The rationale here is that the households whose sizes are very small do not have many financial commitments and therefore use most of their incomes on leisure. As household sizes increase, commitments increase and hence most of the savings are spent on necessities like paying school fees. Very large households imply more spending even during festive seasons and hence a need savings for such festivities.

#### **4.9: Motives for Participation in roscas**

Asked about their motives for participation in roscas, the responses they gave were as presented in table 4.19:

**Table 4.19: Motives for participation in roscas**

Motive	Freq.	Percent
To save money	112	38
To socialize	49	16
To force myself to save	5	2
To assist me when in problems	72	24
To keep away money from spouse	56	19
As a source of loans	4	1
<b>Total</b>	<b>298</b>	<b>100</b>

The table shows that the main motive for participation in roscas is saving money (38%). This is consistent with Besley et.al's (1993) argument that participation in roscas is a way of saving. Roscas come in handy as a survival mechanism for those people to whom formal financial institutions are inaccessible. The second motive for participation is to assist when in problem (24%). This is the same way as saying that roscas are also used as an insurance mechanism by slum dwellers. In the absence of formal insurance mechanisms, they participate in roscas so that they can rush there when they are in problems. The third reason for participation in roscas is to keep away money from spouses. This confirms findings by earlier researchers that people participate in roscas to keep away money from their spouses. The fourth motive is socialization (16%). This explains why even bank employees and other well-to-do people to who access to formal financial institutions and insurance companies are not a problem. Other reasons mentioned for participating in roscas were forcing them to save 2% and as a source of loans 1%.

The motives for participation in roscas per demographic characteristic as shown in table 4.20:

**Table 4.20: Relationship between demographic characteristics and motives for participation in roscas (percentages)**

Variable	Motive for participation in roscas					
	Save	Socialize	Forced Saving	Assist when in problems	hide from spouse	Loan Source
<b>Gender</b>						
Female	36	17	2	26	19	1
Male	42	15	1	19	19	3
<b>Age Category</b>						
18-25 years	27	13	7	33	20	0
26-35 years	36	17	1	24	21	1
36-45 years	47	16	2	21	12	2
Over 45 years	14	14	14	43	14	0
<b>Province of origin</b>						
Nairobi	27	13	0	13	40	7
Central	32	10	3	24	29	1
Nyanza	39	12	0	27	22	0
Western	36	25	2	23	13	2
Rift Valley	47	25	0	22	6	0
Eastern	38	16	2	31	11	2
N. Eastern	67	0	0	0	1	0
Coast	67	11	11	11	0	0

## **Gender**

Among the female participants, (36%) joined roscas to save money, 17% to socialize, 2% as a way of forcing them to save 26% to assist them when in problems 19% to hide money from their spouses while 1% joined as a source of loans. Among the male participants 42% joined to save money, 15% did so to socialize, 1% as a way of forcing them to save, 19% to assist them when in problems, 19% to assist them when in problems, 19% to hide from their spouses while 3% had a motive of having a source of loans. The bigger percentage of both gender therefore participate in roscas as a saving mechanism than any other motive. While a higher percentage of males participate for this purpose than females, more females participate in roscas than males for socialization and as an insurance mechanism.

## **Age**

In the 18-25 age category, 27% joined roscas to save, 13% to socialize, 7% to force themselves to save, 33% to assist them when in problems and 20% to hide money from spouses. None joined as a source of loans. In the 26-35 age category, 36% joined to save, 17% to socialize, 1% to force themselves to save, 24% to assist them when in problems, 21% to hide from spouses and 1% as a source of loans. The 36-45 age category had 47% joining to save, 16% to socialize, 2% to force themselves to save, 21% to assist them when in problems, and 2% as a source of loans. The over 45 years category had 14% joining to save, 14% each to socialize, force themselves to save and 43% to assist them when in problems. This indicates that in the middle age, when the demand for school fees is high, there is need for more savings and hence more participation in roscas to save for fees. As they grow old the need for

savings reduces and social security reduces as they will most probably have retired and therefore they participate more as an insurance mechanism.

### **Ethnicity**

The figures indicate that 27% of the respondents who had originated from Nairobi province joined roscas to save, 13% did so to socialize, 13% to assist them when in problems, 40% to hide money from spouses, 7% as a source of loans while none joined as a forced saving mechanism. Among those from Central province, 32% joined to save, 10% to socialize, 3% to force themselves to save, 24% to assist them when in problems, 29% to hide money from their spouses, and 1% did so as a source of loans. For those who originated from Nyanza province, 39% joined roscas to save, 12% to socialize, 27% to assist them when in problems, and 22% to hide money from their spouses. None joined either to force themselves to save or as a source of loans. Concerning those from Western province, 36% had joined to save, 25% to socialize, 2% as a forced saving mechanism, 23% to assist them when in problems, 13% to hide money from spouses and 2% as a source of loans. Rift Valley had 47%, joining to save, 25% to socialize, 22% to assist them when in problems and 6% to hide money from their spouses. None had joined to force themselves to save or as a source of loans.

For those who had originated from Eastern province, 38% joined to save, 16% to socialize, 2% to force themselves to save, 31% to assist them when in problems, 11% to hide money from their spouses, and 2% as a source of loans. Among those who had originated from North Eastern province, 67% joined roscas to save and the remaining 33% did so to hide money from their spouses. For those who originated

from coast province, 67% joined to save while socialization, forced saving mechanism and assistance when in problems each accounted for 11% of the motives. The people from North Eastern and coast provinces joined roscas mainly to save but this can be attributed mainly to religion. The dominant religion in these provinces is Islam.

The relationship between Psycho-socio characteristics and motives for participation in roscas is as shown in table 4.21:

**Table 4.21: Relationship between Psycho-social characteristics and motives for participation in roscas (Percentages)**

Variable	Motive for participation in roscas					
	Save	Socialize	Forced saving	Assist when in problems	Hide from spouse	Loan source
<b>Marital status</b>						
Married	35	15	2	26	21	2
Single	52	25	0	23	0	0
Divorced/Sep.	27	18	0	54	0	0
Widowe (red)	40	0	20	40	0	0
<b>Does spouse live in the same house?</b>						
No	44	9	4	18	20	0
Yes	38	14	1	25	25	2
<b>Religion</b>						
Catholic	30	11	2	27	27	3
Protestant	44	23	0	22	11	0
Muslim	43	14	29	0	14	0
Atheist	100	0	0	0	0	0

The table shows the following relationships between psycho-social characteristics and participation in roscas:



### **Marital status**

The results indicate that 35% of the married respondents join roscas to save, 15% to socialize, 2% to force them to save, 26% to assist them when in problems, 21% to hide money from spouses while 2% do so as a source of loans. Among the single, 52% join to save, 25% to socialize, 23% to assist them when in problems. For those who were divorced or separated, 27% join roscas to save, 18% to socialize, while 54% do so to assist them when in problems. Among the widowed 40% join to save, 20% as a forced saving mechanism while 40% join so as to get assistance when they are in problems. Among the married, 44% of those who were not residing in the same house with their spouses join to save, 9% to socialize, 4% as a forced saving mechanism and 25% to hide money from their spouses. Among those residing in the same house with the spouse, 38% joined to save, 14% did so to socialize, 1% as a forced saving mechanism, 25% to assist them when in problems, 20% to hide from spouses while 2% did so as a source of loans.

### **Spouse living in the same house**

Where the spouses live in the same house 38% participate in roscas to save, 14% to socialize, 4% to force themselves to save, 25% to assist them when in problems and a similar percentage to keep the money away from the spouse while 2% do so as a source of loans. Where they are not co-habiting, 44% join roscas to save, 9% to socialize, 4% to force themselves to save, 18% to assist them when in problems, 25% to keep the money away from the spouse while none do so as a source of loans. A larger percentage who is not living together, therefore, participates in roscas for economic reasons than when they are co-habiting. Furthermore, when they are co-

habiting, the probability of the spouse mis-using the money increases and hence the need to keep away money from such a spouse.

### **Religion**

A look at the relationship between religion and motive for rosca membership shows that of the Catholics, 30% joined to save, 17% to socialize, 2% to force them to save, 27% to assist them when in problems, 27% to hide from their spouses while 3% joined as a source of loans. Among the Protestants 44% joined roscas to save, 23% to socialize, 22% to assist them when in problems, and 11% to hide from spouses. None of them joined as a forced saving mechanism or as a source of loans. Regarding Muslims 43% joined roscas to save, 14% to socialize, 29% to force themselves to save, and 14% to hide from spouses None joined to assist them when in problems or as a source of loans. All atheists joined to save money. The higher participation of Muslims as a saving device and has a lot to do with the Islamic beliefs of non-payment of interest.

Table 4.22 shows the relationship between socio-economic characteristics and participation in roscas:

**Table 4.22: Relationship between socio-economic characteristics and motives for participation in roscas**

Variable	Motive for participation in roscas (Percentages)					
	Save	Socialize	Forced saving	Assist when in problems	Hide from spouse	Loan Source
<b>Has a mobile Phone?</b>						
No	25	25	0	0	50	0
Yes	38	17	2	25	18	1
<b>Education level</b>						
Primary	24	19	0	15	41	2
Secondary	40	14	1	7	17	1
Post-Sec	45	27	6	18	0	3
<b>Household Size</b>						
1-3	33	18	19	29	17	2
4-5	56	22	3	31	27	2
Above 5	39	16	0	21	24	0
<b>Occupation</b>						
Student	29	14	0	57	0	0
Employed	47	19	0	17	17	1
Formal Business	45	16	4	33	2	0
Informal Business	30	15	2	24	26	2

The table shows that the relationship between socio-economic characteristics and motives for participation in roscas is as follows:

### **Possession of mobile phones**

Among those who own mobile phones, 25% joined roscas to save money, a similar percentage did so to socialize while the remaining 50% did so to hide money from their spouses. This high incidence of relationship between mobile phone owners and hiding money from spouses could be explained thus: If they keep money in the house, there is a possibility that their spouses could take it and use for other purposes or if their spouses know they have the money, they would ask them to allocate it towards the immediate needs of the family. Through saving in roscas, however, participants are able to save enough for purchase of mobile phones, which would otherwise not be seen as immediate needs for the families. It is through hiding the spouses which enables rosca participants to purchase mobile phones. For those who don't have a mobile phone, 38% joined roscas to save, 17% to socialize, 2% to force themselves to save, 25% to assist them when in problems, 18% to hide money from their spouses and 1% as a source of loans. The reason why more people without a phone join roscas to save than those with phones is because of the fact that those with mobile phones see M-pesa as a saving device, a service which is available only to ones who own mobile phones.

### **Education Level**

Among the respondents with primary level education, 24% join roscas to save money, 19% to socialize, 15% to assist them when in problems, 41% to hide money

from their spouses and 2% as a source of loans. For those with secondary level education, 40% join roscas to save money, 14% to socialize, 1% as a forced saving mechanism, 27% to assist them when in problems, 17% to hide money from their spouses and 1% as a source of loans. For those with post-secondary education, 45% join to save money, 27% to socialize, 6% as a forced saving mechanism, 18% to assist them when in problems while 3% do so as a source of loans. None in this category do so to hide money from their spouses.

### **Household size**

Among the respondents with household sizes 1-3, 33% joined roscas to save, 18% to socialize, 19% to force themselves to save, 29% to assist them when in problems, 17% to hide from spouses and 2% as a source of loans.. For those with household size 4-5, 56% joined roscas to save, 22% to socialize, 3% as a forced saving mechanism, 31% to assist them to save, 27% to hide from their spouses and 2% as a source of loans. Regarding household sizes above 5, 39% join to save, 16% to socialize, 21% to assist them when in problems and 24% to hide from their spouses. None in this category joined either to force themselves to save or as a source of loans. Again, as household size increases, the need to save increases to meet the demands for the family. The reason why the desire for savings reduces could also arise from the fact that those with large household sizes are likely to be the old and hence the demands for savings for the families reduce.

## **Occupation**

The results indicate that only 29% of students join roscas to save, 14% to socialize and the remaining 57% to assist them when in problems. Among the employed, 47% join to save, 19% to socialize, 17% to assist them to save, 17% to hide money from their spouses while the remaining 1% did so as a source of loans. For those engaged in formal business, 45% join roscas to save, 16% to socialize, 4% to force themselves to save 33% to assist them when in problems. None joined as a source of loans. For those in informal business, 30% join roscas to save, 15% to socialize, 2% to force themselves to save, 24% to assist them when in problems, 26% to hide from their spouses while 2% do so to have a source of loans. Roscas therefore serve mainly the self employed and more so if they are in informal business. Roscas are therefore not only a saving device but also an insurance mechanism for all occupations.

In summary, people's participation in roscas is driven by multiple motives. Saving is the main motive. This is followed by insurance as roscas assist the members when in problems. Other participants join roscas to hide their money from their spouses while others join for socialization purposes. A minority join roscas as commitment devices for saving or as sources of loans. More males than females join roscas to save. Majority of singles join them to save while majority of the divorcees join them as an insurance mechanism to assist them when in problems. While the difference in the proportion of Christians and Muslims who join roscas with an intention to save is not large, all atheists joined roscas to save. More Muslims than Christian use roscas as commitment devices for saving. By hiding money from their spouses,

rosca participants are able to ensure that their money is not budgeted for in the household budget and therefore they are able to afford mobile phones. The more educated participants are, the less the possibility of joining roscas with the motive of hiding the money from their spouses. This could be because more educated people are likely to have bank accounts and by saving their money in these accounts, it is out of reach of their spouses.

#### 4.10 Allocation decisions

The types of decision making on how to allocate the pot varied as can be seen in table 4.23:

**Table 4.23: Decision making on allocation of the pot**

Type of decision making	Freq.	Percent
Balloting at the formation	133	45
Balloting at beginning of each round	102	34
Balloting at each meeting	55	18
By members request	3	1
Decision made by officials	5	2
<b>Total</b>	<b>298</b>	<b>100</b>

The table shows that majority of the roscas are bidding roscas with 45% balloting for the positions of receiving the pot at the time of formation of the roscas, 34% balloting at the beginning of each round and 18% balloting at each meeting whereby only the members who have not yet received the pot participate. Only 2% of the roscas are decision roscas whereby officials decide whom to give the pot to while

1% of the roscas allocate to the members on request. This is consistent with findings by Gugerty (2005) in Teso and Busia districts in Kenya that 96% of rosca participants knew their order of allocation before the cycle begins and therefore at the start of the rosca cycle there are no uncertainties to resolve. Like her study in which the order was repeated in 37% of her sample respondents, in this sample it was repeated in 45% hence implying that people participate in roscas for reasons beyond financing of indivisible good as suggested by Besley et. Al (1993)

#### **4.11 Frequency of contribution**

The frequency of contribution to the roscas is as shown in table 4.24:

**Table 4.24: Frequency of contribution to roscas**

<b>Contribution frequency</b>	<b>frequency</b>	<b>Percent</b>
Daily	80	27
Weekly	150	50.7
Bi-weekly	3	1.0
Monthly	63	21.3

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Majority of the respondents thus contribute weekly while the minority contributes bi-weekly. The amount contributed ranges from Ksh.20 daily contribution to a high Ksh.3, 000 monthly contributions.

#### **4.12: Uses of the rosca pot.**

The respondents were asked how they used the last pot received from roscas. Their responses were as shown in table 4.25:



**Table 4.25: Use of last pot received from rosca**

Use	Freq.	Percent
Bought a durable good	41	14
Paying school fees	75	26
Bought household consumption good	72	25
Bought clothes	15	5
Invested in business	84	29
Gave spouse	6	2
<b>Total</b>	<b>293</b>	<b>100</b>

These findings indicate that the main use of the rosca funds is not purchasing indivisible durable goods. It contradicts Besley et.al's (1993) durable good argument. It is also in contradiction with Gugerty's (2007) findings that the main uses are buying household items and paying school fees as it indicates that the main uses are investment in business and paying school fees. This upholds findings by Kimuyu (1999) in rural Kenya. That the main use was investing in business indicates that the poor save in roscas as a result of result of lack of better avenues for saving.

In Summary, the main use of the pot was investment in business. This was followed by payment of school fees and buying of household consumption goods. Purchase of durable goods was fourth while a small proportion of participants had either bought clothes or given to their spouses. Contrary to Besley et al's argument, purchase of a durable indivisible good does not therefore seem to be a major motive for participation in roscas. A great majority of Muslims (80%) used the pot to pay

school fees unlike 17% of Catholics and 25% Protestants. The reason behind this argument could be that while Christians could take loans to pay school fees, Muslims, due to their belief in non-payment of interest prefer to accumulate money for payment of school fees through roscas.

#### **4.13 REGRESSION RESULTS**

This section discusses the regression results derived from the discrete choice models. It starts with results of the probit model and the proceeds to results of the multinomial probit models.

##### **4.13.1 Probit results.**

A probit regression equation was estimated for the probability of an individual participating in a rosca. It took the form of:

$y^* = \beta X_i + \mu_i$ , where  $X_i$  was the vector of explanatory (independent variables) which included age of the respondent, sex, marital status, household size, education level, province of origin occupation, subscription to mobile money transfer service, possession of a bank account, individual discount rate, food expenditure, income and percentage of wife's contribution to the household budget;  $\beta$  was the vector of parameters and  $\mu_i$  was the error term subject to the usual statistical assumptions..

The results for binary probit regression results of a person participating in a rotating savings and credit association are shown in table 4.26:

**Table 4.26: Binary Probit regression results****Dependent variable is rosca membership**

Variable	Coefficient.	Z-statistic
Age	.0015843	1.59
Gender	-2.941207	-3.48 *
Marital status	.6294721	0.72
Household size	-.036587	-2.09 *
Education	-.5132693	-2.58 *
Central	-3.143401	-0.80
Nyanza	-2.957284	-0.74
Western	-3.106796	-0.80
Rift Valley	-4.227743	-1.10
Eastern	-2.501181	-0.64
North Eastern	-2.757926	-0.71
Coast	-2.322375	-0.57
Student	-.9106019	-0.31
Employed	.8121077	0.28
Formal business	2.454339	0.80
Informal business	.8325493	0.29
Discount rate	.0954128	3.16 *
Income	-.0240046	-0.39
Percentage of wife's contribution	-.0330006	-2.61 *
Muslim	-1.237505	-0.97
Cons	10.56312	

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\* Significant at .05 percent level

**Key:**

Age: This is the age of the respondent in years

Gender: This is the gender of the respondent represented by a dummy variable  
1= male 0= Female

Marital status: This is the marital status of the respondent represented by a dummy variable 1= single 0 otherwise (Married, divorced, separated, widowed)

Household size: This is the size of the household of the respondent

Education: This is the measured by the number of years one has been in school

Central: This is a dummy variable for province of origin of the respondent 1 if province of origin is central province and 0 otherwise

Nyanza: This is a dummy variable for province of origin of the respondent 1 if province of origin is Nyanza and 0 = otherwise

Western: This is a dummy variable for province of origin of the respondent 1 if province of origin is Western province and 0 otherwise

Rift Valley: This is a dummy variable for province of origin of the respondent 1 if province of origin is Rift Valley province and 0 otherwise

Eastern: This is a dummy variable for province of origin of the respondent 1 if province of origin is Eastern province and 0 otherwise

North Eastern: This is a dummy variable for province of origin of the respondent 1 if province of origin is North Eastern province and 0 otherwise

Coast: This is a dummy variable for province of origin of the respondent 1 if province of origin is coast province and 0 otherwise

Student: This is the occupation of the respondent if he/she is a student. It is represented by a dummy variable 1= student 0= otherwise

Employed: This is the occupation of the respondent if he/she is a employed either in the private sector or public sector. It is represented by a dummy variable 1= Employed and 0= otherwise

Formal business: This is the occupation of the respondent if he/she is engaged in a formal business. It is represented by a dummy variable 1= engaged in formal business; 0= otherwise

Informal business: This is the occupation of the respondent if he/she is engaged in informal business. It is represented by a dummy variable 1= engaged in informal business 0= otherwise

Discount rate: This is an estimation of the individual discount rate. It was estimated by asking the respondent how much they would give up if they were to receive Ksh.10, 000 now as opposed to the same time next year.

Income: This is the income bracket of the respondent. There were 4 income levels: 1. Below Ksh.5000. 2. 5,001-7,500 3. 7,501-10,000  
4. Above 10,000

Percentage of wife's contribution: This is the percentage that the wife contributes to the household budget. It is measured by the actual percentage the respondents indicated is contributed by the wife.

Religion: This is a proxy for the religion of the respondent. It is measured by a dummy variable 1= Muslim and 0= otherwise.

### **Discussion of results**

The dependent variable is membership to a rosca. This was measured by a dummy variable which was given a value of 1 if one was a member of a rosca and zero otherwise.

The probability of participation in roscas is estimated against demographic, psychosocio and socio-economic characteristics of the households. The estimation results show that age does not significantly affect membership to roscas though there is a positive relationship between age and membership to roscas. This could be due to the fact that the young are either in school or they don't have a lot of commitments to make them save in roscas or maybe the relatively younger are familiar with operations of banks and therefore save and borrow in banks rather than roscas.

Gender of the participants was estimated by a dummy variable which assumed the value of 1 for males and 0 for females. The coefficient for gender was negative and significant. It supports findings by other researchers that gender significantly affects participation in roscas with females participating more than males. It contradicts the

situation in Benin where there was no difference in participation between males and females.

Marital status of the respondents assumed a value of 1 if the respondent was single and zero if he/she was married, divorced or separated or widowed. The reasoning behind this was that those who were not single were married at some time even if they are currently divorced, separated or widowed. The coefficient for marital status shows that there is a positive but insignificant relationship between membership and marital status. This indicates that singles are more likely to participate in roscas than the married. This contradicts findings by other researchers that rosca participation is more among the married than the singles.

Education, measured in years of schooling, significantly affects membership to roscas negatively. The less educated are more likely to participate in roscas than the more educated. This confirms findings by Ashraf et al.(2006) in Philippine who also observed that there was more participation of the less educated. This is simply because while people in informal settlements have generally less access to formal financial services, this is particularly so for those with less education.

Household size is also a strong determinant of participation in roscas. The coefficient has a negative sign indicating a higher probability of participating in a rosca when the household size is small. Smaller households are likely to have more money to commit in roscas as their financial commitments are fewer. A positive correlation exists between household size and poverty whereby household size can be said to be a proxy for poor socio-economic environment. It can, therefore, be

argued that the poorer the respondents, then the lower their probability of participation in roscas.

Ethnicity, whose proxy is the province of origin of the respondent, does not affect participation in roscas. This was estimated by dummy variables which had a value of 1 if the respondents had originated from each of Kenya's provinces as opposed to Nairobi. All the provinces had a negative but insignificant sign which implies that ethnicity is not a factor determining participation in roscas. This is unlike findings by Gugerty (2007) that most rosca members were from the largest ethnic community in her sample. It is possible, however, that findings suffered a statistical bias as her sample was based on female members of women groups only.

Occupation was estimated using dummy variables with a value of 1 for each of the categories in the questionnaire which included student, employed in the private sector, employed in the public sector, engaged in formal business or engaged in informal business and zero otherwise. Only the coefficient of student was negative though not significant indicating that students were less likely to participate in roscas. All the other occupations had positive coefficient though insignificant. Being employed therefore enhances the probability of participation in roscas but the type of employment one is engaged in does not matter.

The coefficient for individual discount rates shows that this is a significant determinant of participation in roscas. This confirms our hypothesis that the higher the discount rate, the bigger the probability of participating in a rosca. Present biased individuals are therefore likely to participate in roscas hoping to receive the pot



earlier and hence purchase their desired goods earlier rather than wait for a long time to accumulate enough through saving on their own.

The coefficient for income is positive and significant meaning that participation in roscas in slums increases with the level of income. This confirms our hypothesis that low level income individuals, living at the subsistence level, cannot afford contributions to the rosca. As income increases, they can afford contributions and therefore their probability to participate in roscas increases.

The coefficient for wife's contribution to the household budget is negative and significant showing that the less the proportion of wife's contribution to the household budget, the higher the probability of participation in roscas. This means that women with less commitment towards provision for their families, because they are assisted by their husband in meeting most of the household needs, have more to spare and hence can participate in roscas. Those on the other hand who are very committed in provision for their families have less to spare and hence to contribute in roscas. This contradicts findings by previous researchers who argue that the higher proportion of wife's contribution, the higher the probability of joining roscas.

### **Policy Implications**

As the critical factors likely to influence participation in roscas are gender, household size, education level, individual discount rates and percentage of wife's contribution to the household budget, then it implies that these should be the target groups for policy aimed at mobilizing savings among the poor using the approaches

used in roscas. Such a policy targets should be women- especially those who are not household heads, the less educated and those with small household sizes.

#### **4.13.2 Multinomial logistic results for motives of participation in roscas**

The multinomial regression results for motives of participation in roscas are as shown in table 4.27:

**Table 4.27: Multinomial logit parameter estimates for motives of participation in roscas (z-values in parenthesis)**

	Save	Socialize	Forced Saving	Assist in Problems	Keep away from spouse
Gender	-.1822668 (-0.14)	-1.726524 (-1.23)	-37.88166 (-0.00)	-1.999095 (-1.42)	-.7643652 (-0.50)
Age	-.001027 (-0.35)	-.002755 (-0.90)	-.0035166 (0.00)	-.0036028 (-1.17)	-.0029966 (-0.98)
Spouse lives in same house	-20.81558 (-3.56)*	-20.57537 (-3.55)*	-21.96856 (-1.01)	-20.41478 (-3.48)*	21.3945 (3.64)*
Household size	.1114625 (0.98)	.0988635 (0.84)	-.0076648 (-0.05)	.1307162 (1.14)	.1693405 (1.47)
Religion	-22.11087 (-0.00)	23.62231 (2.86)*	31.29275 (0.00)	17.06089 (-0.00)	25.27359 (3.06)*
Education	-.3387059 (-0.80)	.0458313 (0.10)	.2136391 (0.34)	-.0319707 (-0.07)	-.5598639 (-1.30)
Discount rate	-.0085519 (-0.18)	.0480847 (0.95)	.0777072 (1.12)	.0441845 (0.91)	.0231908 (0.46)
Income	.0372274 (0.20)	.0851889 (0.43)	-.4224795 (-1.00)	.2014201 (1.04)	-.4106944 (-1.76)
Percentage of wife's contribution	-.0020239 (-0.04)	-.0123292 (-0.25)	-.2376321 (-1.47)	.0117826 (0.25)	.0267307 (0.57)
Student	32.05448 (0.00)	-8.213615 (-0.00)	38.94207 (0.00)	1.770124 (0.00)	-11.29247 (-0.00)

Employed	30.59073 (17.44)*	27.54981 (7.86)*	-1.145262 (-0.00)	-2.545697 (0.00)	22.4156 (0.00)
In formal business	29.5181 (0.00)	26.7175 (0.00)	30.27931 (0.00)	-1.575491 (-0.00)	19.62282 (0.00)
In informal business	5.358452 (1.41)	1.90381 (0.89)	8.054733 (0.97)	-25.27245 (-5.98)*	-102592 (-0.00)
Marital status	22.19267 (18.17)*	-16.37041 (-0.00)	-8.5304 (-0.00)		-16.74213 (-19.06)*
Constant	20.09283 (0.0)	18.57727 (0.98)	18.88127 (0.00)	47.20012 (0.00)	32.04412 (0.00)

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Number of observations	=	166	LR chi2(75)	=	183.40
Log likelihood	=	-148.80127	Pseudo R2	=	0.3813

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\* Significant at 0.05 level

## Discussion of results

The table shows the multinomial regression results for motives of participation in roscas as follows:

### Gender

The coefficients for gender, which was measured by a dummy variable 1 for males and 0 for females, are negative for all the motives for participation indicated by the respondents namely saving, socializing, forcing the participants to save, assisting the participants when in problems or keeping the money away from the spouse. Though

none of the coefficients is significant, the results show that whatever the motive for participation, females are more likely to participate in roscas than males.

### **Age**

The coefficient for age is also negative for all the motives for participating in roscas. Again, the coefficients are not significant.

### **Spouse living in the same house**

The coefficient for saving motive is negative and significant. This means that where spouse is living away, the probability of participating in roscas increases. This could be because if they are living together, one may not need to save a lot as the spouse supplements income for meeting the household needs. When the spouse is away, there is no one to run for when the available finances are not sufficient to meet the household expenses and therefore the need to save.

The coefficient for participation in roscas for socialization motive is also negative and significant. When the spouse is living away, the other spouse may be lonely and looking for avenues to remove his/her loneliness, such a spouse participates in roscas. The spouse may also bar the other from spending a lot of time outside the home if he lives within but this is not so if he/she lives away from home.

The coefficient for assistance when in problems is also negative and significant. The argument for this scenario is similar to the one for saving motive in that when the spouse lives away and there is a problem in the household, the other spouse has nobody to rush to. In such a case, one joins a rosca as an insurance mechanism so

that he/she can have reliable people to assist when he/she has problems or as a source of finances for emergency cases.

Though the coefficient for forcing one to save is negative, it is not significant. The coefficient for the motive of keeping money away from spouse is positive and significant when the spouse lives in the same compound. This implies that when both are living in the same house, the probability of one of the spouses “stealing” money from the other spouse increases. In households where chores are divided, each spouse tries as much as possible to hide his/her actual income from the other one in fear that if the spouse knows that he/she has some extra income he/she can be given additional roles. In such scenarios, then the spouse keeps the money in roscas to hide it from the spouse.

### **Household size**

Apart from the coefficient for forced savings which is negative, though not significant for household size, all the other coefficients are positive though not significant.

### **Religion**

This was measured by a dummy variable which had a value of 1 for Muslims and 0 for non-Muslims. The coefficient for savings was negative which means that more non-Muslims have a higher probability of participating in roscas for saving motives than Muslims. It is an indication that Muslims are less thrifty than non Muslims. The coefficient for Muslims participating in roscas for socialization motive is positive and significant indicating that to Muslims, roscas serve a social function more than

an economic one. The coefficient for forcing one to save is positive but not significant. Similarly is the one for assistance while in problems. The coefficient for keeping away the money from the spouse is positive and significant. This means that Muslims are likely to join roscas with the motive of keeping money away from spouses than non Muslims. Since Muslims are allowed to marry many spouses, trust among spouses may be minimal. Wives may fear that their husbands may use their money to assist their co-wives and may therefore like to keep it where their husbands cannot reach it. They therefore commit it in roscas.

### **Education**

The coefficient for the saving motive is negative but is not significant. The coefficient for socialization motive is positive but not significant. The coefficient for forced saving as a motive for rosca participation is also positive but not significant. The coefficient for assistance when in problems as a motive for participation in roscas is negative but not significant. Keeping away money from the spouse as a motive for participation in roscas has a negative sign though not significant.

### **Discount rate**

The variable for saving as a motive for rosca participation is negative but insignificant. The coefficients for the motives of socialization, forced savings, assistance when in problems and keeping money away from spouses, though all positive are insignificant.

## **Income**

The coefficient for saving as a motive of participation in roscas is positive but not significant. The coefficient for socialization is also positive but insignificant. The coefficient for forced savings as a motive for rosca participation is negative though insignificant. The coefficient for assistance when in problems is also positive though insignificant. As income increases, the poor can afford to think of insurance mechanisms, something which is beyond the thoughts of the poorest in society.

The coefficient for keeping money away from the spouse as a motive for participation in roscas is negative though not significant.

## **Percentage of wife's contribution**

The coefficient for saving as a motive for participation in roscas is negative though not significant. The coefficient for socialization as a motive is also negative though it is insignificant. Forced saving also has a negative but insignificant sign. The coefficient for assistance when in problems is positive but insignificant. The coefficient for keeping money away from the spouse is positive but insignificant.

## **Occupation**

This was measured by dummy variables for each of the occupations. The first one was for student which had a dummy variable 1 if student and zero if otherwise. The coefficient for savings was positive but insignificant. The coefficient for socialization was negative but insignificant. The coefficient for forced saving as a motive for participating in roscas when one is a student is positive but insignificant. The coefficient for assistance when in problems is positive for students but not



significant. The coefficient for keeping money from spouses is negative but not significant.

Employment both in the private and public sector was measured by a dummy variable with a value of 1 if one was employed and 0 if otherwise. The coefficient for saving as a motive for participation in roscas is positive and significant. Such people are likely to be the educated and highly economically rational and therefore join roscas for economic reasons. The coefficient for participation in roscas for socialization motive for the employees is positive and significant. Being busy in their places of work most part of the week, such employees participate in roscas for socialization. It is during rosca meetings that they get updates of the happenings in the residential areas.

The coefficient for forcing one to save as a motive for participation in roscas for employees is negative but insignificant. The coefficient for keeping away money from the spouses is positive but insignificant.

Engagement in formal business was measured with a dummy variable with a value of 1 if one was engaged in formal business and 0 if otherwise. The coefficient for savings as a motive for participation in roscas was positive and significant; those engaged in formal business save to accumulate funds for expansion of their businesses. Their intention could be to receive the pot earlier to invest them in their business and make profits with them. The coefficient for socialization is also positive but insignificant. The coefficient for the forced savings motive is positive implying that in their desire to save any profits attained from their businesses rather than spend them on consumption goods, businessmen and women join roscas to

force them to save. The coefficient for assistance when in problems as a motive for participation for this category is negative though not significant. The coefficient for keeping away money from spouses is positive but not significant.

Engagement in informal business was measured by a dummy variable with a value of 1 if one was in informal business and 0 if otherwise. The coefficients for savings motives and socialization and forcing one to save were all positive but insignificant.

The coefficient for assistance when in problems was however negative and significant. Due to their low income levels, participants in informal business do not consider risks as a major priority. They rather use the money they have to boost their businesses. The coefficient for keeping the money from the spouse is negative but not significant.

### **Marital status**

Marital status was measured by a dummy variable with a value of 1 for single and 0 if otherwise. The coefficient for savings as a motive for participation in roscas for singles was positive and significant. Single people are likely to be younger and with less items in their houses. They therefore participate in roscas to accumulate money to purchase household items and also in case they like to invest in businesses in future, they have to save.

The coefficient for socialization among the singles is negative but not significant. The coefficient for forced savings among the singles is also negative though it is insignificant. The coefficient for assisting them when in problems is negative but insignificant. The coefficient for keeping money away from spouses is negative and

significant. This is obviously due to the fact that singles do not have spouses and hence they have no risk of losing money to spouses.

### **Policy implications**

The findings on multiple motives for participation in roscas implies that any policy measure designed to transform savings currently in roscas must address the multiple features of the roscas which include a socialization and insurance element. Any design of a micro-finance product aimed at replacing roscas which does not address the non-economic elements is doomed to fail. It also implies that roscas are compliments to formal finance rather than substitutes.

#### **4.13.3: Multinomial logistic results for preferred period of receiving the pot**

Table 4.28 presents multinomial logistic regression results for preferred period of receiving the pot:

**Table 4.28: Multinomial logistic regression results for preferred period of receiving the pot (z-values in parenthesis)**

	Beginning	End	School opening Period	Festive season
Gender	.0350369 (0.05)	-.2705932 (-0.46)	.0138078 (0.02)	-7586134 (-0.61)
Age	.0007726 (0.88)	.0002985 (0.36)	-.0004122 (-0.43)	.0005893 (0.3)
Spouse lives in Same house	.7165577 (0.62)	-.257931 (-0.3)	-1.974749 (-2.49)*	-9687774 (-0.68)
Household size	-.055684 (-1.62)	-.0444052 (-1.61)	.0006731 (0.03)	.0175959 (0.57)
Religion	22.96259 (0.00)	24.57415 (10.22)*	-10.21118 (-0.00)	-1.03397 (-0.00)
Education	.1548371 (1.02)	.0241248 (0.20)	.0966865 (0.69)	.2278203 (0.83)
Discount rate	-.026155 (-1.26)	.0138202 (0.81)	.0064271 (0.35)	-0080574 (-0.24)
Income	-.1273417 (-1.39)	-.1128058 (-1.54)	-.0393705 (-0.51)	-1010588 (0.67)
Percentage of Wife's contribution	.0035574 (0.21)	.0337234 (2.42*)	.0227874 (1.68)	-.0296328 (-0.91)
Student	24.89001 (0.00)	-11.7063 (-0.00)	-1.840608 (-0.00)	-8.68882 (-0.00)
Employed	.2247749	.8887338	-25.06386	1.968759

	(0.10)	(0.50)	(-8.67)*	(0.58)
Formal business	.9915576	.679804	-25.39204	-31.35599
	(0.44)	(0.39)	(-8.73)*	(-0.00)
Informal business	.1376838	-1.124561	-26.38186	.5068509
	(0.07)	(-0.09)	(-9.19)*	(0.17)
Marital Status	.9657094	-1.59728	-1.566491	-3.22619
	(1.18)	(-1.86)	(-1.76)	(-0.00)
Constant	-2.060447	.1533737	26.03458	-3.673401
<hr/>				
Number of observations	=	166	LR chi2(60)	= 84.49
Log likelihood	=	-202.75938	Pseudo R2	= 0.1724

- Significant at 0.05 percent level

### Discussion of results

The table shows the relationship between socio-economic variables and the preferred period of receiving the pot follows:

#### Gender

The coefficient for gender, which was measured by a dummy variable 1 for males and 0 for females, is positive but not significant for preference of receiving the pot at the beginning. The coefficient for preferring the end is negative but insignificant. The coefficient for preferring the time of school opening is positive but insignificant. The coefficient for preferring festive season is negative but insignificant.

## **Age**

The coefficient for age is positive for preference receiving the pot at the beginning though it is not significant. The coefficient for the end is also positive but insignificant. The coefficient for preferring the school opening period is negative indicating that younger participants are likely to prefer this period than the older ones. The old people are likely to have finished educating their children and therefore the less preference for this period.

## **Spouse living in the same house**

The coefficient preferring the beginning is positive but insignificant. Preference for the end of the rosca cycle for this category is negative but insignificant. The coefficient for preferring the time of school opening is negative and significant. When the spouse lives away, all the household chores are on the resident spouse. So as he/she does not spend all his/her money and experience problems when it comes to the time of paying school fees, he/she commits such funds in roscas preferring to get it when schools are opening. The coefficient for preferring the festive season for this category is negative but insignificant.

## **Household size**

The coefficient for household is negative, though not significant. The coefficient for preferring the end is also negative though insignificant. The coefficients for preferring to receive the pot when schools are opening and during festive seasons are both positive though insignificant.

### **Religion**

The coefficient for Muslims preferring the beginning is positive though insignificant. The coefficient for Muslims preferring the end is however positive and significant. This can be attributed to their religious belief of non-payment of interest and hence accumulating savings in non-interest attracting schemes like roscas. The coefficients for preferring to receive the pot during the school opening periods and during the festive seasons are both negative but insignificant.

### **Education**

The coefficients for all the periods were positive but insignificant for all the periods.

### **Discount rate**

The coefficient for preferring the beginning is negative but not significant. The coefficients for the end or during school opening periods are positive and insignificant. The coefficient for preferring the festive season is negative but insignificant.

### **Income**

The coefficients for income are negative for all the periods but they are all insignificant.

### **Percentage of wife's contribution to the household budget**

The coefficient for preference of the beginning is positive but not significant. The coefficient for preferring the end is positive and significant. When a woman contributes a high percentage of the household budget, then it means that her decision making power also increases and therefore, given that women like participating in roscas due to the social networks involved in them, then they will participate in roscas for socialization motives. Given women's risk averse nature and fear of being indebted, they will prefer to receive the pot at the end of the cycle so that they don't feel as if they are indebted to their colleagues in the roscas.

The coefficient for preferring the time of school opening is positive but insignificant while the coefficient for preferring the festive season is negative but insignificant.

### **Occupation**

This was measured by dummy variables for each of the occupations. The first one was for student which had a dummy variable 1 if student and zero if otherwise. The coefficient for preferring the beginning is positive but insignificant. The coefficients for other time preferences for students are all negative though they are insignificant.

Employment both in the public and private sector was measured by a dummy variable with a value of 1 if one was employed and 0 if otherwise. Except the coefficient for preferring the school opening period which is negative and significant, all the others are positive but insignificant. Employees are likely to afford paying school fees without necessarily saving in roscas. Such employees are



likely to have other sources of school fees like education loans from Saccos or their employers.

Engagement in formal business was measured with a dummy variable with a value of 1 if one was engaged in formal business and 0 if otherwise. The coefficient for preferring the beginning or the end was positive but not significant. The coefficients for during time of school opening and during the festive season are both negative. However, only the one for the school opening period is significant. Rather than save in roscas, which usually pay no interest, for school fees or for expenditure during festivities, businessmen would rather buy stock for their businesses because by the time of school fees payment, such money will have generated some return.

Engagement in informal business was measured by a dummy variable with a value of 1 if one was in informal business and 0 if otherwise. The coefficients for preferring the beginning and during festive seasons are positive but not significant. The coefficients for preferring the end and during the school opening period are negative. However, only the one for school opening period is significant. Being business people, they would rather receive the pot at the beginning and invest it in business. Furthermore, rather than receive the pot when schools are opening, they rather receive it earlier and invest in business so that by the time of opening schools, it will have earned them some profits.

### **Marital status**

Marital status was measured by a dummy variable with a value of 1 for single and 0 if otherwise. The coefficient for preferring to receive the pot at the beginning is

positive but not significant. The coefficients for all the other time preferences are negative but insignificant.

### **Policy implications**

Since different participants prefer different time periods of receiving the pot, this explains the sustainability of roscas. If all the members had similar time preferences, then those who do not win the bid for the pot would leave and the roscas would disintegrate. In designing microfinance products, it should be born in mind these differences in time preferences and hence different products should be tailor-made for the different types of customers. There should be a mix of products with some being difficult to access until a particular time period while others should be flexible enough to cater for the different preferences of customers.

#### **4.13.4 Multinomial logistic results for allocation decisions**

Table 4.29 presents the multinomial logistic results for allocation decisions:

**Table 4.29: Multinomial logistic regression for allocation decisions (z-statistics in parenthesis)**

	Balloting at formation	Balloting each round	Balloting at each meeting	Decision made by Officials
Age	.0713599 (122.84)*	.0701383 (76.82)*	.1214827 (0.00)	.0021426 (0.19)
Spouse lives in same house	-70.76459 (-71.21)*	-72.43893 (-105.18)*	-14.60843 (-1.29)	-12.70659 (-1.09)
Household size	-.4552575 (-14.89)*	-.4559419 (-15.43)*	-.0972051 (-0.51)	-.0110456 (-0.05)
Education	-13.57309 (-105.59)*	-1.221868 (-0.80)	-13.73017 (-113.45)*	-1.210551 (-0.73)
Discount rate	1.130905 (0.85)	1.163935 (65.25)*	1.152502 (48.73)*	.1505712 (0.66)
Income	.1208818 (0.22)	-.1740155 (-0.31)	-.2050047 (-0.37)	.1009475 (0.17)
Gender	13.31184 (18.46)*	13.1581 (18.73)*	4.879013 (0.41)	6.77638 (0.56)
Percentage of wife's Contribution	-1.455353 (-1.60)	-.18664 (-1.38)	-.2272019 (-1.67)	-.203626 (-1.41)
Student	-.0729756 (-0.00)	5.123542 (0.09)	2.719895 (0.04)	.5239752 (0.01)
Employed	.5088879 (0.01)	5.946302 (0.13)	6.291426 (0.12)	2.037535 (0.04)
Formal business	-1.384232 (-0.03)	5.556833 (0.12)	4.880384 (0.10)	2.657674 (0.05)

Informal business	-0.413622	5.851289	5.882957	2.762158
	(-0.01)	(0.13)	(0.12)	(0.05)
Marital Status	20.99073	(-0.9309654)	-1.675408	.5913275
	(13.68)*	(-0.06)	(-0.10)	(0.03)
Constant	30.72401	25.23635	24.19195	27.2592
	(0.63)	(0.50)	(0.45)	(0.50)

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Number of obs = 172      LR chi2(56) = 160.73      Prob > chi2 = 0.0000

Log likelihood = -110.77944      Pseudo R2 = 0.4204

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\*Significant at 0.05 level

### Discussion of Results

The coefficients age for balloting at the formation of the rosca and balloting at the beginning of each round are both positive and significant. This shows that older persons participate mainly in bidding roscas where the order of receipt of the pot is predetermined. This means that to such people, achieving the pot earlier so as to purchase a good is not a motive for the older people participating in roscas as if that was the case, then those who don't get earlier chances of receiving the pot would fall out of the roscas. The motive of socialization could override the economic motive for older participants.

The coefficients for spouses living in the same house are negative and significant for both balloting at formation of the rosca and for balloting at the beginning of each round. This implies that for those households where spouses do not live in the same house, the probability of participation in bidding roscas is also higher. The reasoning for this is that since the spouses are far apart, they are likely to be lonely and hence

they join roscas for socialization. Such people may not care about the time they will receive the pot as the primary motive is not economic.

The coefficients for household are also positive and significant for both balloting at formation and balloting at the beginning of each round. As large households have many members who are likely to be contributing more income to the household, then members of such households are likely to participate in roscas for non-economic motives.

The coefficients for education are negative and significant for both balloting at the formation of the rosca and balloting at each meeting. This means that the probability of joining bidding roscas reduces with education. The more educated are likely to be more rational than the less educated and thus would prefer to save their income in less risky forms and where it would earn interest rather than in roscas where no interest is earned. With less access to formal banking services and being less rational on the other hand, the less educated save in roscas even though they know that they will get the money last. Again, balloting time is fun and as the less educated may not be having other avenues of having fun, they may also like to ballot at the time of each meeting to have fun. Balloting at each meeting also acts as a mechanism of ensuring that all the members attend meetings as only the attendants may ballot and also discouraging disgruntled members from leaving the rosca as, as long as one has not won he/she has a chance to win during each meeting.

The coefficients for discount rate are positive and significant for balloting at the beginning of each round and balloting at each meeting. Present biased individuals do not want to commit themselves for long as they are not sure if their time preferences

for their money will change with time. As such, they rather ballot at the nearest opportunity. Such opportunities happen either at each meeting or at the beginning of each round and hence such individuals prefer these types of allocation decisions.

The coefficients for gender are both positive for balloting at the beginning of the rosca cycle and at the beginning of each round. As this variable was measured by a dummy variable 1 for males and 0 for females, this means that men are likely to join bidding roscas. Women like making fun more than men once they are together and hence they would like to be balloting as many times as possible and hence having fun. Men, on the other hand, join roscas either for socialization and hence do not care the time they will get the pot or it can be argued that men prefer working on pre-arranged budgets. Once they know when they are to receive the pot, then they can have adequate time to budget for it.

The other significant variable affecting the allocation decision is marital status which is positive. This variable was measured by a dummy with a value 1 and 0 if otherwise. Singles are therefore more likely to participate in bidding roscas where the decisions are made at formation of the rosca. The reasoning behind this can be two-fold. The single are likely to be lonelier than the married and therefore their probability of joining roscas for socialization motives is higher. On the other hand, it may be argued that since their financial obligations are less than the married, then they may join roscas to keep away any spare money they may have to avoid the temptation of spending it. As such, even if they know that they will receive the pot later in the cycle, they don't mind but they continue their participation.

### **Policy implications**

Males, singles, the educated and members of small household sizes prefer knowing when to expect the rosca pot so that they can plan their expenses. This may imply that when designing savings schemes for such people, such designers should come up with products with a definite maturity time periods. These may include fixed saving schemes for definite time periods or if it is a case of credit schemes they should have repayment with fixed monthly deductions.

## **CHAPTER FIVE**

### **5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Summary of major findings**

The study examined the participation in roscas in an urban informal setting. Specifically it wished to determine the demographic, socio-economic and socio-economic characteristics of rosca participants and to determine the motives for participation in roscas. It also wished to find out how the rosca pot is allocated and the time preferences for receipt of the rosca pot. Data was collected among 400 residents of Mathare valley, the oldest slum in Nairobi, an area inhabited by low income households. The study targeted the household as the unit of analysis with the heads of households as the respondents. However, where the head of the household was absent, the spouse or any other responsible person was the respondent. In total 65% of the respondents were females while 35% were males. A total of 272 respondents representing 69% were married of whom 74% were staying in the same house with their spouses.

Catholics comprised of 52% while Protestants comprised of 45%. The average size of the household was four with a range of between one and sixteen. Majority (70%) of rosca members had primary school level of education while 18% had secondary school level of education. The remaining 16% had gone beyond secondary school level. Regarding occupation, 48% of rosca participants were involved in informal business, 17% were in formal business, and 33% were employed while 2% were students.



A total of 298 of the respondents (75%) were members of roscas of whom 85% were female. Membership ranged between 2 and 150. The number of roscas they belonged to ranged from one to six. Households where the spouses live in the same house comprised 79% of rosca participants while only 21% did not live in the same house. The average contribution averaged Ksh.462 with a range of between Ksh.20 daily contribution and Ksh.3000 monthly contribution. The motives for participation in roscas were given as saving money 38%, to assist when in problems 24%, to keep away money from spouse 19%, to socialize 16%, as a forced saving mechanism 2% and as a source of loans 1%.

Among the respondents, 90% said that they save something for future use. The main devices for saving were indicated as banks (55%), rosca and M-pesa (18% each) and at home (10%). The reasons given for choice of the saving mode were security (33%), confidentiality (22%) accessibility of the mode (20%) ability to get a loan (16%) inaccessibility of the money (6%) and easy access of the money (3%).

## **5.2 Conclusions**

The results of the study have concluded that slum dwellers in fact save contrary to popular believe that such people do not save. In making their selection of saving devices, they consider security, the ability to get a loan, accessibility and confidentiality. Banks are the most secure modes while roscas are the devices which give them access to loans. M-pesa is the easiest to access while home is the most confidential.

The main source of borrowing for the slum dwellers (53%) was found to be relatives and friends another 17% borrowing from money lenders. Only 25% of the

respondents borrow from banks indicating that there is limited accessibility to formal credit sources.

Probit results showed that gender significantly affects the probability of participation in roscas with females more likely to participate than males. Education level also affects participation in roscas with the less educated being more likely to participate than the more educated. Household size negatively and significantly affects participation in roscas. This implies that members of smaller households are likely to participate more than members of larger households. Individual discount rates also positively and significantly influences participation in roscas with those who with high discount rates more likely to participate than with low individual discount rates. This implies that present biased individuals participate in roscas more with the hope of accumulating faster and hence acquiring their desired goods earlier than saving on their own hence confirming Besley's early pot motive of participation in roscas.

The percentage of wife's contribution to the household's budget also negatively and significantly influences the probability of participation in roscas. This finding, coupled with the finding that 50% of husbands give their spouses money to contribute to roscas and that 50% of households where both spouses live in the same house lead to the conclusion that participation in roscas is a household strategy.

The motives given for participation in roscas were saving, to assist them when in problems, to keep away the money from their spouses and to socialize. Roscas therefore act not only saving devices but also as substitutes for insurance as members rushed there when in problems for assistance. Multinomial logit results on the motives for participation in roscas showed that participation in roscas for saving

motive is where the spouses do not live in the same house, the single and the employed.

Those who participate in roscas for the socialization motive are those not living in the same house with the spouse, Muslims and the employed. Those who participate with the motive of assistance when in problems are those not living in the same house with their spouses and those engaged in informal business.

Keeping money away from the spouse is another motive for participation in roscas where both spouses are living in the same house and also among Muslims. Since singles do not have spouses, then they don't participate with the motive of keeping money away from spouses. The motive of socialization was significant among Muslims and also among the employed.

The majority of the respondents have no preferred period for receiving the pot. Among those with preferences, the time most preferred was the school opening period followed by the end of the rosca. This implies that the participation in roscas is for than the economic reason of receiving the pot early. Participation in roscas is for a particular motive and hence differences in time preferences of receiving the pot. It is due to these differences in time preferences which makes sustainability of roscas possible otherwise if all preferred to receive the pot at the same period, once they bid, the ones fails to win the bid at the preferred period would leave and the rosca would disintegrate.

Multinomial logit results showed that when both spouses live in the same house, they prefer receiving the pot at the end of the cycle. Muslims also preference

receiving it at the end and so do those households with a high percentage of wife's contribution to the household budget. Negative and significant coefficients were observed for the period of opening schools for the employed and those engaged in both formal and informal business.

Multinomial logit results for allocation decisions showed positive and significant coefficients for balloting at formation of roscas for age, gender and marital status. This means that the old, males and the single are more likely to make allocation decisions at the time of the formation of the rosca. It had negative and significant coefficients for balloting at the time of rosca formation for spouses living in the same households and household size. Balloting at the beginning of each rosca cycle had positive and significant coefficients for age, discount rate and gender while it had negative and significant coefficients for spouses living in the same house and household size. Balloting at each meeting was positive and significant for discount rate while it was negative and significant for level of education.

The study further found out that most of the rosca participants had mobile phones and had subscribed to electronic money transfer systems. There was no effect of subscription to an electronic money transfer system on rosca participation as a similar proportion of those who had subscribed and those who had not subscribed were members of roscas. Membership to roscas, may, however assist members to purchase mobile phones through assistance in savings or giving loans to members to purchase mobile phones. Peer pressure among members may also assist in ensuring that members purchase mobile phones.

The main use of the pot was investment in business followed by paying school fees and purchase of household goods. The argument that participation in roscas is for the purchase of indivisible durable goods is therefore negated by the findings of this study.

Ethnicity does not affect participation in roscas. Religion however, affects participation in roscas with more participation among Protestants followed by Catholics. Muslims were third in participation while atheist participate the least. The poor participation by respondents who had originated from North Eastern and Coast provinces could therefore be interpreted as a result of dominance of Islamic faith rather than ethnicity per se.

### **5.3 Recommendations**

The findings of this study have shown that the poor can and in fact do save. Interested micro-finance institutions intending to mobilize the savings of the poor should therefore not fear establishing their institutions where the poor live as the potential is there. However, for their endeavors to succeed, in their design of their products, they should focus on the motives for which the poor save. These include savings, an element of insurance and if possible ensure that they have an aspect of socialization as these are the reasons why the poor participate in roscas.

As their savings are relatively small, there should be no minimum daily deposits but rather they should be accepting any amount. Collaboration between banks and electronic money transfer service providers should entail agreements that the poor deposit these low amounts and be able to transfer them to their bank accounts.

Charges for such services should not be exorbitant as high charges would deter them from transferring such money to their bank accounts.

Any successful microfinance efforts meant to tap the savings among the poor which is currently in roscas should focus on the less educated, females, especially those who are not household heads and the members of small household sizes.

As some people were seen to participate in roscas for insurance reasons, incorporating an element of micro-insurance in designing microfinance for the poor could probably make such institutions attractive for the poor and therefore make them divert some of the funds currently saved in roscas to the micro finance institutions. Since roscas serve multiple motives and not just the economic one, it can be argued that they are compliments and not substitutes of formal finance. They have been co-existing and will continue doing so.

#### **5.4 Suggestions for further research**

This study considered participation in roscas using the household as the unit of analysis for a slum setting in an urban area only. A similar study should be conducted in the rural areas to find out whether similar factors affect participation in urban and rural areas and whether participation is driven by similar motives. As participation in roscas is also prevalent among the higher income groups in the Kenyan community, a similar study should be conducted among the medium and high income population to see if similar participation trends exist and if they are driven by similar motives.

Though the indications of the findings of this study are participants do not make their payment of rosca dues through electronic money transfer systems as this would make them lose their motive of socializing, an empirical study to investigate whether this is true should be conducted. Studies should also be conducted on the factors determining the amount of contributions to roscas and the number of roscas one belongs to.

## References

- Adams D. W. (1992). Taking a fresh look at informal finance: in D. W. Adams and D.A Fitchett (eds), *Informal finance in low income countries* Boulder: West View Press.
- Adams, D. W. (1984). Are Arguments for cheap credit sound? In Adams, D.W., Graham, D.H and Von Pischke, J. B., (eds) *Undermining rural development with cheap credit*, West View Press: Boulder, Colorado.
- Adams, D.W. Fitchett, D.A. (1992). (Eds.) *Informal finance in Low-Income countries*. West View Press, Colorado.
- Adams, G. and Schvaeveldt J. (1991). *Understanding Research Methods* 2<sup>nd</sup> Ed New York, Longman.
- Akoten, J. E., Sawada Y, and Otsuka, K. (2006). The determinants of Credit Access and its impacts on micro and small enterprises: The case of garment producers in Kenya, *Economic Development and Cultural Change*, 54, 927-944.
- Aliber, M. (2001). Rotating savings and credit associations and the pursuit of self-discipline, *African Review of Money Finance and Banking*, 51–72.
- Alila P.O. (1993). Informal credit and rural sector Enterprise development Paper presented at a seminar on “Networks of small and intermediate size enterprises in African Industrialization” Nairobi, 19-22 January.
- Anderson, S. and Baland, J.M. (2007). The economics of roscas and intra-household resource allocation, *Quarterly Journal of Economics* 117 (3), 963– 995.
- Anderson, S., Baland, J.M., and Moene, K.O., (2002). Sustainability and organizational design in roscas: some evidence from Kenya. Manuscript, University of Namur.
- Ardener, S.(1964). The comparative study of rotating credit associations. *Journal of the Royal Anthropological Society of Great Britain and Ireland* 94, 201-229.
- Arderner,S. and Bouman,S. (1995). (Eds.) *Money-Go-Rounds: The importance of Rotating Savings and Credit Associations for Women*. Berg Publishers Limited, Oxford.
- Arendo D. (1993). The informal and semi-formal financial sectors in Ethiopia. A study of the *Iqqub*, *Iddir* and savings and credit co-operatives. AERC Research paper no 21



- Ashraf, N., Gons, N., Karlan, D., Yin, W. (2001). A review of commitment savings products in developing countries. Asian Development Bank Economics and Research Department Working paper 45.
- Aryeetey E., and Gockel, F (1991). Mobilizing Domestic resources for capital formation in Ghana. The role of informal financial sectors, AERC research paper 3
- Aryeetey, E., and Hyuha M. (1990). Informal financial institutions and markets in Africa: An empirical study, Paper written for the IBRD Africa Economic conference Nairobi.
- Aryeetey E. and Udry, C. (1997). The characteristics of informal financial markets in Sub-Saharan Africa, *Journal of African Economics*, supplement to Vol. 6 no 1.
- Aryeetey E. (1992). The relationship between the formal and informal sectors of the financial markets in Ghana, AERC Research papers no 10.
- Atieno R. (2001). Formal and Informal institutions lending policies and access to Credit by small-scale enterprises in Kenya: An Empirical Assessment, AERC Research paper no. III
- Bari, F.(1998). Essays on modeling innovative and flexible credit arrangements: The case of Rotating Savings and Credit Association(Roscas). Thesis submitted to the faculty of Graduate Studies and Research in partial fulfillment of requirements of the degree of Doctor of Philosophy. McGill University; Montreal.
- Besley, T. (1995). Nonmarket institutions for credit risk sharing in low-income countries, *Journal of Economic Perspectives* 9 (3), 115–127.
- Besley, T. and Levenson, A. (1996). The Role of Informal Finance in Household Capital Accumulation: Evidence from Taiwan, *Economic Journal*, CVI, 38–59.
- Besley, T., Coate, S., Loury, G. (1993). The economics of rotating savings and credit associations, *American Economic Review* 83 (4), 792– 810.
- Bhatt V.V. and Meerman J. (1978). Resource mobilization in Developing Countries: Financial institutions and policies, *World Development* Vol. 6 no 1 PP 90-123
- Bouman, F. (1977). Indigenous savings and credit societies in the third world: a message, *Savings and Development* 1 (4), 181–218.
- Bouman, F. (1995). Rotating and accumulating savings and credit associations: a development perspective, *World Development* 23 (3), 371– 384.

- Calomiris, C.W. Rajaraman, I. (1998). The role of roscas: lumpy durables or event insurance, *Journal of Development Economics* 56, 207– 216.
- Central Bank of Kenya (2009). *Finaccess 2009 survey results*. Government printer.
- Chamlee-Wright, E. (2002). Savings and accumulation strategies of urban market women in Harare, Zimbabwe, *Economic development and cultural change* Vol. 50 No. 4
- Chipeta, C and Mkandawire, M.L.C. (1991). The informal financial sector in Malawi scope, size and role, AERC Research Paper no 14
- Creswell, J. (1994). *Research Design: Qualitative and Quantitative Approaches*. Thousand Oaks, CA, Sage.
- Dagneliev O. and Boucher P.,L. (2008). Rosca Participation in Benin: a Commitment issue” UFAE and IAE working papers 735.08
- Gakure R.W. and Otieno, A, (2006). Factors affecting growth of Small-scale enterprises (Jua Kali) in Nairobi, *Journal of Human Resource and Entrepreneurship Development* Vol. 1. No.1, November.
- Geertz, C. (1962). The Rotating Credit association: A `middle rung in development, *Economic Development and Cultural change* 10, 241-263.
- Gugerty, M.K. (2000). You can't save alone: Testing theories of Rotating Savings and Credit Associations. Mimeo. Harvard University.
- Gugerty, M. K.(2007). You Can't Save Alone: Commitment and Rotating savings and Credit Associations in Kenya, *Economic Development and Cultural Change*. pp. 251-282.
- Gurley J. G. and Shaw, E.S. (1955). Financial aspects of Economic Development, *American Economic Review* 49 PP 515-38.
- Handa, S. and Kirton C. (1999).The Economics of Rotating Savings and Credit Associations: evidence from the Jamaican ‘Partner’, *Journal of Development Economics*, 60(1): 173-194.
- Kan, K., (2000). Informal capital sources and household investment: Evidence from Taiwan, *Journal of Development Economics*, 62 (2000), 209-232.
- Kedir A.M., (2011). ROSCAs in Urban Ethiopia: Are the characteristics of the institutions more important than that of members? *Journal of development studies* Vol 47, issue 7
- Kibuuka, L.E., (2006). Informal finance for the middle and high income individuals in South Africa: A Case study of high budget “Stokvels”

in Pretoria. Thesis Submitted in partial fulfillment for the degree of Magister Institutionum Agrariae (Agricultural Economics), Department Of Agricultural Economics, Extension, and Rural Development, Faculty of natural and Agricultural Sciences, University of Pretoria, Pretoria.

- Klonner, S. (2000). Rotating Savings and Credit Organizations as Insurance, mimeo, University of Heidelberg, 2000.
- Klonner, S. (2003). Rotating Savings and Credit Associations with Risk Averse Participants, *International Economic Review*, 44(3): 979-1005.
- Killick, T and Mweya F. M. (1988). Monetary Policy in Kenya 1967-1988, Unpublished research paper.
- Kimuyu, P.K. (1999). Rotating savings and credit associations in rural East Africa, *World Development* Vol. 27 No. 7 July pp1299-1308
- King C. (2009). God's Word, *Urbana* Dec 27-31 2009.
- Liedholm, C. and Chuta, E., (1976). The Economics of Rural and Urban Small-Scale industries in Sierra Leone. African Rural Economy Paper no.14.
- Maddala, G.S. (1983). *Limited-Dependent and qualitative variables in econometrics*. London, New York
- Maddala, G.S. (1988). *Introduction to Econometrics*. Macmillan Publishing, New York
- Malkamaki, M. and Johnson, S. (2009). The role of informal financial groups in extending access in Kenya, A Report Prepared for Financial Sector Deepening Trust.
- Mckinon R. I. (1973). *Money and capital in Economic development*. Brookings institutions, Washington D.C.
- Mauri A. (1987). The role of financial intermediation in the mobilization and allocation of household savings in developing countries: interlinks between organized and informal circuits; The case of Ethiopia, Paper presented to an international experts meeting on domestic savings mobilization through formal and informal sectors: comparative experiences in Asian and African Developing Countries held at the East-West centre, Honolulu 2-4 June.
- Muriithi, M.K. (2009). The demand for health care in a Nairobi slum: The role of quality and information, Thesis submitted in fulfillment of the requirements for the degree of Doctor of philosophy in Economics of the University of Nairobi.

- Namusonge G.S. (1999). Determinants of growth oriented Small and Medium Enterprises in Nairobi, Kenya. Thesis Submitted in fulfillment of the requirements for the degree of Doctor of Philosophy, Jomo Kenyatta University of Agriculture and Technology.
- Niger-Thomas, M. (1995). Women's Access to and Control of Credit in Cameroon: The Mamfe Case," Ardener, S. and Bouman+, S., eds., *Money-go rounds: The Importance of Rotating Savings and Credit Associations for Women* (Washington, DC: BERG 1995), pp. 95–110.
- Nguyen, Q., (2010). Present bias and rosca Participation: Evidence from field experiment and household survey data in Vietnam Faculté de Sciences Économiques et de Gestion, Université Lumière Lyon 2, 93 Chemin des mouilles 69130 Ecully, France.
- Ouma A.P.S. (1991). Informal financial sector in Kenya. The case of Siaya district, unpublished M. A. Research Paper, Kenyatta University.
- Platteau, J. (2000). *Institutions, Social Norms and Economic Development* Amsterdam: Harwood Academic Publishers, 2000).
- Raccanello, K., Anand, J., and Martnez, P.A., (2009). Social capital as an incentive for participation and formation of women-dominant roscas, *Economic development, integration and morality in Asia and the Americas. Research in economic Anthropology* Vol 29 PP 407-429.
- Republic of Kenya (2011). Economic Survey, Government printer: Nairobi
- Sandsor, A.M.J. (2010). The Rotating Savings and Credit Association - An Economic, Social and Cultural Institution, Thesis for the degree Master of Economic Theory and Econometrics Department of Economics University of Oslo.
- Saunders, M., Lewis, P., and Thornhill, A. (2003). *Research Methods for Business Students* 3<sup>rd</sup> edition. New York: Pearson.
- Seibel H. D. (1986). Rural finance in Africa; The role of informal and formal financial institutions, *Development and change* 6 PP 12-14.
- Sethna A., (1992) *Kenya's Informal Sector Entrepreneur*, Research Paper No. 9, Unpublished
- Tanaka, T, Camerer, F.C and Nguyen, Q. (2009). Rosca as a Saving Commitment Device for Sophisticated Hyperbolic Discounters: Field Experiment from Vietnam, Working Paper, Global Studies Center, Arizona State University.
- Thingalaya N. K. (1978). Mobilizing small savings in India. Innovations in Banking. The syndicate experience. Domestic finance studies No.

46. Development Economics department, Development Policy Staff of World Bank.
- Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, 26(1), pp24-36
- Toluhi, M. (1986). The role of savings bank in mobilization of domestic savings in Nigeria, *Journal of economic and social studies* vol. 8, No. 2 PP 208 - 218.
- Udry C. (1994). Credit Markets in Northern Nigeria Credit as insurance in a rural economy in Hoff K., Braveman, A. and Stiglitz, J. (eds.). *The economies of rural organizations: theory and policy*. London: Oxford University Press.
- Udry, C. and Aryeetey, E. (1997). The Characteristics of Informal Financial Markets in Africa, *Journal of African Economies*, vol. 6, no. 1.
- USAID, (1989). Informal financial markets in Senegal and Zaire. Final report." published by Arthur Young for the bureau of private enterprises of USAID.
- Van den Brink, R. and Chavas J-P. (1997). The Microeconomics of an Indigenous African Institution: The Rotating Savings and Credit Association", *Economic Development and Cultural Change*, 55: 745-772.
- Van Winjergen S. (1983 ). Interest rate management in LDCs, *Journal of monetary Economics* 12(3) pp 433
- \_\_\_\_\_ (1986). Credit Policy, inflation and growth in a financially repressed economy. *Journal of development economics* 13 (1-20 p. 45.
- U Tun Wai (1956). Interest rates in the organized money markets of undeveloped countries". IMF staff papers VOL. 6 No. 1 August PP 197-214.
- \_\_\_\_\_, (1957). Interest rates outside the organized money markets of undeveloped countries, *IMF Staff papers* vol. 6 No. 1 August PP 197-214.
- Varadharajan S. (2004), Explaining Participation in Rotating Savings and Credit Associations (Roscas): Evidence from Indonesia. Department of Economics, Cornell University.
- Von Pishke, J. D. (1981). Towards an operational approach to savings for rural developers, In Von Pischke, J. D, Adams, and Donald, (eds.) *Use and abuse of rural financial markets in low income countries*. EDI Training materials. World Bank.

Zeller, M. (1998), "Determinants of repayment performance in Credit Groups: The role of programme design inter-group risk pooling and social cohesion". *Economic development and cultural change* Vol. 46, No. 3 599-62

**FOR RESEARCH PURPOSES ONLY**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY  
DEPARTMENT OF COMMERCE AND ECONOMIC STUDIES**

**INFORMAL FINANCIAL SERVICES SURVEY**

Questionnaire Number           -----  
Name of Enumerator   (Optional)   -----  
Name(s) of Respondent(s)       -----  
Date of Interview               -----

**OBJECTIVES OF THE STUDY**

This study seeks to explore access to informal financial services in Mathare with specific focus on Rotating Saving and Credit Schemes. In particular, we are interested in finding out why some households/persons are more likely to participate in such schemes while others are less likely, and the impact of socioeconomic variables and recent innovations in money transfer systems on such participation. The information generated using this survey will be used for research purposes only and will be treated in strict confidence. Thank you very much for your assistance.

Note to Enumerators: This questionnaire is intended for the head of the Household, in the absence of whom it should be administered to a knowledgeable member of the household. Kindly take time to explain the purpose of the study to the respondent.

**PERSONAL DETAILS OF THE RESPONDENT**

1.Age in years	2.Gender Male =1 Female = 0	3.Relationship with the HH Head Same = 1 Spouse = 2 Daughter = 3 Son = 4 Other(spec) = 5	4.Marital status Married =1 Single =2 Divorced/ Separated =3 Widowe(re)d=4 Other (spec) =5	5. If married, do both spouses live in same house? Yes = 1 No = 0	6.What is the size of your household in number of people?	7.Religion Catholic =1 Protestant =2 Muslim =3 Atheist =4 Other (spec) =5	8. Province of origin 1.Nairobi 2. Central 3. Nyanza 4. Western 5.Rift- Valley 6. Eastern 7. North Eastern 8. Coast	9. No. of years of formal education?	10.Main occupation Student = 1 Employed Private = 2 Employed public = 3 Artisan =4 Formal business =5 Informal business = 6 Other (specify)	11. Which geographical location gives you greatest sense of identify? This neighborhood=1 Mathare =2 Nairobi =3 My province =4 Kenya =5 Africa =6 Other (specify) =7
IFS1	IFS2	INF3	IFS4	IFS5	IFS6	IFS7	IFS8	IFS9	IFS10	IFS11

**ACCESS TO MONEY TRANSFER SERVICES**

12.Do you have a mobile phone? 1. Yes 2. No [GO TO 14]	13. Have you subscribed to any of the following services? 1. M-pesa 2. M- Kesho 3. Zap 4. Yu- Cash	14.If yes, what do you mainly use this service for? 1. Saving money 2. Transferring money 3. Receiving money 4. Transacting my bank account Other (specify)	15. Do you use any other money transfer systems? Yes = 1 No = 2 [ GO TO 16]	16. If yes to question 14, what are these other money transfer systems Postal services =1 Western Union =2 Banks to Bank = 3 Other (specify) =4
IFS12	IFS13	IFS14	IFS 15	IFS 16



**SAVING BEHAVIOUR OF RESPONDENTS**

17. Do you have a bank account? 1. Yes 2. No	18. Do you save some money for future use? 1. Yes 2. No	19. If Yes, Where do you save? 1. Bank 2. Rosca 3. Post office 4. Sacco 5. Home 6. M-pesa 7. Zap 8. Other (Specify)	20. Why do you prefer this mode of saving? 1. Easily accessible 2. More secure 3. Can't get the money easily 4. Its confidential 5. Can get loan 6. Can get back money easily 7. Other (specify)	21. Approximately what percentage of your monthly income do you save?	22. Do you ever borrow? Yes =1 No =2 [GO TO 23]	23. If Yes from whom? Relatives =1 Friends =2 Workmates=3 Other business persons =4 SACCO =5 Banks =6 Money lenders=7 Other (specify)=8	24. How many shillings would you be willing to give up today so that you receive 10,000 shillings about this time next year?	25. If some one promised you some 10000 next year, how much less you accept if the payment were to made immediately?
IFS17	IFS18	INF19	IFS20	IFS21	IFS22	IFS 23	IFS 24	IFS 25

**MEMBERSHIP OF ROSCAS AND CONTRIBUTIONS**

26. Do you belong to a rosca? 1. Yes 2. No	27. If Yes, How many do you belong to?	28. How frequently do you contribute? 1. Daily 2. Weekly 3. Monthly 4. Other (Specify)	29. How much money do you contribute each round?	30. How many members are you?	31. How long does it take to complete each round?	32. How do you decide who receives the pot? 1. Balloting at the formation 2. Balloting at beginning of each round 3. Balloting at each meeting 4. By members requesting 5. Decision made by officials 6. Other (Specify)	33. Do you allocate all the money collected at each meeting? 1. Yes 2. No	34. If Not, What percentage do you save?	35. Where do you save it? 1. With treasurer 2. In bank. 3. In M-pesa 4. In Zap 5. Other (Specify)	36. Does your husband give you money to contribute to the rosca? 1. Yes 2. No 3. Not applicable	37. Do you discuss with your spouse how to use the money from the rosca? 1. Yes 2. No
IFS26	IFS27	IFS28	IFS29	IFS30	IFS31	IFS32	IFS33	IFS34	IFS35	IFS 36	IFS 37

**MOTIVES FOR PARTICIPATION IN ROSCAS AND USE OF FUNDS**

<p>38.What was your main reason for joining the rosca?            1.To save money            2.To socialize            3. To force myself to save            4. To assist me when in problems.            5. To keep away money from spouse            5. As a source of loans            6. Other (specify)</p>	<p>39.When do you prefer to receive your share of proceeds from the rosca?            1. At the beginning            2. At the end            3. At the time of opening schools            4. During the festive season            5. No preferred period            6. Other period (Specify)</p>	<p>40.Why do you prefer this period?            1. I benefit more            2. Don't want to be indebted            3. That's when needs for money are more            4. Other reason(Specify)</p>	<p>41.When did you last receive the pot (money from the rosca)?</p>	<p>42.What did you use it for?            1. Buying a durable good            2. Paying school fees            3. Bought household consumption goods            4. Bought clothes            5. Invested in business            6. Gave to spouse            7 Other (specify)</p>	<p>43. How frequently do you meet members of your scheme other than during structures meetings?             Very frequently =1            frequently=2            Often =3            Occasionally =4            Not at all =5</p>
IFS38	IFS39	IFS40	IFS41	IFS42	IFS 43

**INCOME AND EXPENDITURE DECISIONS**

<p>44.Who makes the major decision regarding expenditure in your household?            1. Self            2. Spouse            3. Usually jointly</p>	<p>45.Roughly what proportion of household expenditure is contributed the wife in this household?</p>	<p>46.What is your approximate household expenditure on food per month?            1. Below Ksh 5000.            2. 5001-7500            3. 7501-10,000            4. Above 10,000</p>	<p>47.Approximately how much is your monthly income?            1. Below Ksh 5000.            2. 5001-7500            3. 7501-10,000            4. Above 10,000</p>	<p>48.Roughly how much is your spouse's monthly income?            1. Below Ksh 5000.            2. 5001-7500            3. 7501-10,000            4. Above 10,000            5. Don't know</p>
IFS44	IFS45	IFS46	IFS47	IFS48