DOES MEMBERSHIP HOMOGENEITY MATTER FOR GROUP BASED FINANCIAL SERVICES? EVIDENCE FROM THE GAMBIA

by

Geetha Nagarajan, Richard L. Meyer and Douglas H. Graham

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The authors are Research Specialist and Professors, respectively, Rural Finance Group, Department of Agricultural Economics, The Ohio State University, Columbus, Ohio 43210.

Ph. (614)-292-8014; Fax: (614)-292-7362.

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Abstract

This paper examined the effect of membership composition on the components of groups designed to provide financial services, and on the performance of these groups. Regression results based on data from RoSCAs in The Gambia show that gender homogeneity is less likely to affect components of group design than is homogeneity in income generating capacity of members. Membership homogeniety does not directly affect the repayment performance of the members but only indirectly through the components of the group design.

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I. Introduction

Formal financial systems in Sub-Saharan Africa have proven to be inefficient and costly in providing financial services, especially for small enterprises and the poor. But several types of informal finance efficiently service a wide variety of borrowers denied access to formal finance. Informal financial services are provided through diverse types of individual and group arrangements. Many of the indigenous group arrangements are designed as rotating savings and credit associations, while others are non-rotating in nature. Indigenous groups are often observed to be fairly homogenous in their membership composition and this homogeneity is expected to be an important aspect which contributes to their sustainability[1].

Several non-governmental organizations (NGOs) have become active in providing financial services in The Gambia through organizing groups of persons to save and/or borrow together [2]. This form of finance is potentially important because of the absence of formal banks in many areas, and their lack of interest in attempting to serve low income people. The majority of the groups formed by NGOs have fairly homogenous members [3]. However, NGOs face problems in determining which of several possible member characteristics should be homogenous; they incur high costs in forming groups with relatively homogenous members on the assumption that homogeneity contributes to sustainability. Furthermore, membership heterogeneity may have some unrecognized advantages. Heterogeneity may have two advantages in reducing both congestion among members in using group services, and delinquency and default risks due to covariance in their incomes [4]. Some NGOs, therefore, are attempting to introduce member

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[1] See Bouman, Frits, "ROSCA and ASCRA: Beyond the Financial Landscape", in Financial Landscapes Reconstructed: The Fine Art of Mapping Development, Frits Bouman and Otto Hospes, eds., Boulder: Westview Press, 1994, pp. 375-394.

[2] See Nagarajan, Geetha, Douglas H. Graham and Richard L. Meyer, "Financial Intermediation through ROSCAs in Peri-Urban Gambia", Columbus: Department of Agricultural Economics, The Ohio State University, Report Submitted to USAID/The Gambia, January 1994.

[3] This is not unique to the NGOs in The Gambia. For example, the groups used by Grameen Bank in Bangladesh are small and homogenous in their membership.

[4] For example, floods or drought in a region may systematically negatively affect the incomes of all the farmers growing similar crops in that region. Therefore, groups composed of similarly impacted farmers may suffer high delinquency problems because the majority of members may simultaneously experience liquidity problems.

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heterogeneity into their groups. A drawback is that increased heterogeneity may make groups vulnerable to mismatches in member interests and can reduce the information that group members have about each other needed for successful screening and monitoring functions required for good loan repayment.

The net effect of membership homogeneity on group design and performance depends on the relative importance of informational advantages over reduction in covariance risks in a given environment. In static societies with limited migration and opportunities for income diversification, and a lack of external insurance, informational problems may be less important relative to risks due to income covariance. Furthermore, information problems may be important only for newly formed groups, and not for existing groups with stable membership. In other words, access to information may be a short-run problem, while risks due to covariance in incomes are a long-run problem.

A well designed institution needs to allocate resources among its members in an optimal and sustainable fashion. While membership composition may not directly affect program sustainability, it may influence group design and performance thereby indirectly affecting sustainability. Therefore, it is important to assess the effect of membership composition on various components of group design, and examine if certain membership attributes can be heterogenous without affecting the optimal allocation of services to group members and their loan repayment performance.

This paper presents an empirical analysis conducted to examine if the membership composition of indigenous financial groups explains group performance and the key components of group design that affect the services received by group members. While group performance is measured by delinquency and default rates, the value of services received by group members is primarily determined by three components of group design: (i) membership size, (ii) fund size, and (iii) fund allocation methods. Data gathered in The Gambia from 88 indigenous rotating savings and credit associations (RoSCAs) called osusus are used to examine the propositions derived in this paper that relate membership composition with design characteristics and osusu performance [5]. The design of indigenous RoSCAs emerges slowly over time through trial and error. The attributes of indigenous groups explain how they achieve sustainability. The factors found to explain the good experience of indigenous osusus, therefore, offer insights into the way that NGOs might design their financial groups to also achieve long-term sustainability. Differences in design between indigenous and NGO organized groups may represent areas that will threaten NGO sustainability.

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[5] Indigenous osusus are formed by members themselves whereas NGO osusus are created by the NGOs.

II. Description of the Sample

A random sample of 88 indigenous osusus with a total membership of 1,850 persons functioning in six villages surrounding the city of Banjul were selected for study. The leaders of the osusus were interviewed using a structured questionnaire during the February-April period of 1993. The sample was limited to osusus composed of individuals primarily engaged in five general sets of economic activities: civil service, farming, food retailing, fruit and vegetable retailing, and tie-dye retailing.

Osusus are indigenous associations that provide financial services to a wide variety of members employed in various occupations. In general, the members of an osusu agree to contribute a fixed amount of cash and/or goods into a common fund or pot at regular intervals [6]. The pot is then allotted to one of the members (sometimes more) based upon some previously agreed criteria that may involve a fixed order of rotation, a lottery or a simple request. Each member contributes a fixed amount at each turn or rotation and receives the pot once until the entire cycle is completed; then the group may disband or the cycle may recommence with the same or a different set of members and terms and conditions. In order to capture the loan repayment performance of the groups, data were gathered for one cycle that was completed just prior to the interview.

Table 1 presents selected features of the sampled osusus. The majority of these osusus were operating continuously for an average of 2.8 years. While 24% of the osusus reported changes in their membership size, 11% altered their fund size between the reference cycle and the time of their origin. These changes reflected the flexibility of these groups to meet member requirements. The members saved small amounts [7] and the average amount of funds collected and allocated at each rotation was 1,314 Dalasis (US$ 155). The rotation occurred on an average every seven days. The size of funds varied, however, among the employment types with the largest pots collected by groups composed of civil servants and tie-dye sellers. The difference in fund size indicates differences in the incomes earned in different types of employment. Group size was small with an average membership of 21 persons. Membership size was similar among all employment types except the osusus composed of civil servants which tended to be smaller.

The pots of funds were allocated in each rotation by random and non-random methods. While 58% of the sampled osusus followed random methods, 42% used non-random methods. The random methods included the use of lotteries or simple request options while the non-random methods included fixed-order arrangements and lotteries held at the beginning of each cycle. When the lottery method is used, it is held at the beginning of each osusu cycle or at every rotation of the pot. In the request method, the members determine the pot allocation based on

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[6] The terms pot and fund are used interchangeably in this paper.

[7] Much larger RoSCAs have been reported in Cameroon and Niger where the volume of funds intermediated is large and comparable to that of formal credit unions. See Bouman, Frits, "ROSCA and ASCRA: Beyond the Financial Landscape", in Financial Landscapes Reconstructed: The Fine Art of Mapping Development, Frits Bouman and Otto Hospes, eds., Boulder: Westview Press, 1994, pp. 375-394.

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requests made by members desiring to receive it. This system usually works on a first-come first-served basis, but members with emergencies, such as funerals, medical expenses, theft and fire, are given priority. In the fixed order method, members may receive the pot according to the order in which they are recruited into the osusu, or the order may be fixed according to member seniority measured by age or the number of hands played by a member [8], or by the number of members recruited by each member into the osusu.

Delinquency due to late payments by members during the study period that covered one complete cycle prior to the interview was reported by 36% of osusus. The delinquent members represented only four percent of total members. Defaults in which members totally stopped paying their shares after receiving their pots were reported in 13% of the osusus, but defaulted members represented less than 1% of the total members. The delinquency and default rates were highest among farmer and tie-dye sellers compared to other employment types (table 1). In general, delinquency and default resulted in smaller pots being allocated to members. Occasionally, the group leader paid the share for a member who had a genuine reason for delinquency. Frequent delinquency and default resulted in the member being expelled from the group. Occasionally, delinquent members were given a strict warning and were allowed to continue participating in the group but were denied the privilege to request a pot early in the rotation.

An examination of average fund size, membership size and pot allocation methods by repayment performance shows that fund and membership sizes were significantly higher among delinquent and defaulted osusus compared to non-delinquent and non-defaulted osusus. Osusus with delinquencies and defaults tended to allocate funds using non-random methods rather than random methods. Nonetheless, while no significant difference was noticed in method of pot allocation in delinquent osusus, there were differences among defaulted, non-delinquent and non-defaulted osusus (table 2).

While three fourths of the sampled osusus were composed of occupationally homogenous members, about two thirds were composed of members homogenous in age or gender. About half of the sampled osusus were simultaneously homogenous in gender, age and employment type. The members were considered homogenous in age if the age difference do not exceed 15 years, homogenous in gender if all members belong to one gender, and homogenous in employment if over 75% of the members were employed in one of the same five employment categories considered in this study.

III. Conceptual Framework

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[8] Hands refer to the number of contributions that a member makes at each rotation period. One member may contribute more than one hand in order to receive the pot more than once during the complete rotation. Alternatively, persons with insufficient cash may band together to contribute one hand.

Several analysts have argued that membership homogeneity is an essential component in the design of group based lending programs [9]. The theory of clubs advanced to examine group dynamics argues that membership homogeneity reduces information problems. While information advantages exist for homogenous groups, two problems arise. First, there is the risk of crowding out in the distribution of group services due to the homogeneity in member preferences because of high covariance in the demand for financial services. This may result in congestion and queuing as several members desire a loan at the same time. This could give an opportunity for powerful group members to exert their influence and crowd out weaker ones [10]. Second, delinquency and default rates may be higher due to a similarity in preferences and covariance in income flows.

Let us assume that osusu members maximize their utility function with respect to the expected net benefits (Y) derived from participation in the group [11]. These net benefits include: (i) financial services through access to group funds, and (ii) insurance through reciprocity since cohesive group members with moral bonds will coinsure each other and reciprocate obligations in times of need. Therefore, Y consists of elements of the osusu design that ensures allocation of financial services to members in terms of fund size (F), membership size (M) and fund allocation methods (A) [12]. Whereas the fund size determines the quantity of financial services that a member obtains from participating in a group, the fund allocation method determines the method

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[9] For a review of group based lending programs, see Devereux, John and Raymond Fishe, P.H., "An Economic Analysis of Group Lending Programs in Developing Countries", The Developing Economies, Vol. 31, No. 1, March 1993, pp. 102-121.

[10] See Cornes, Richard and Todd Sandler, The Theory of Externalities, Public Goods and Club Goods,Cambridge: Cambridge University Press, 1986, and Sandler, Todd and John Tschirthart, "Club Theory: Thirty Years Later", Unpublished paper, Ames: Department of Economics, Iowa Stater University, 1994.

[11] This specification is an extension of the models proposed by Cornes, Richard and Todd Sandler, The Theory of Externalities, Public Goods and Club Goods, Cambridge: Cambridge University Press, 1986, and Slover, Curtis H., "Informal Financial Groups in Rural Zaire: A Club Theory Approach", Unpublished Ph.D. Dissertation, Columbus: Department of Agricultural Economics, The Ohio State University, 1991.

[12] The fund size refers to the size of pot that a member receivers at each rotation period. Evidence from The Gambia shows that due to delinquencies differences exist in size of funds received by each member in each rotation. Therefore, fund size may not be a simple linear combination of membership size. Also, members placed at the end of the cycle get smaller effective loans because most of their pot represents returned deposits rather than loans. See Schreiner, Mark, Douglas H. Graham and Geetha Nagarajan, "Predicting Creditworthiness with Publicly Observable Characteristics: Can Informal Finance Help Reform Formal Finance in Africa?", Columbus: Department of Agricultural Economics, The Ohio State University, ESO No. 2220, 1995.

of access to loans. A larger membership size may reduce fixed costs per person in a group, but it also increases congestion and peer monitoring costs thus reducing the net value of services received by a member.

Let the value of the group services be R and the costs incurred in participating in a group be C. These costs include fixed and variable costs incurred for group formation and peer monitoring. *Ceteris paribus*, R and C are affected by membership composition (MC) and availability of member information (I). Let the other factors affecting R and C be N, a constant. The model can be written as:

$$Max \quad E \left(U[Y(F,M,A)] \right) \tag{1}$$
$$st. \quad R(MC,I,N) - C(MC,I,N) \geq 0$$

The performance of the group is also affected by membership composition which influences the availability of information and risks due to covariance in member incomes or preferences. Assume the probability of member delinquency/default to be d. It follows that members repay their loan obligations on time with a probability 1-d. Now, the model can be rewritten as:

$$Max \quad \mathfrak{L} = d \left(U \; [Y(F,M,A)] - \lambda \; [R(MC,I,N) - C(MC,I,N)] \right) \tag{2}$$
$$+ \quad (1-d) \left(U \; [Y(F,M,A)] - \lambda \; [R(MC,I,N) - C(MC,I,N)] \right)$$

Maximization of equation 2 with respect to F,M, A and d yields by implicit function theorem,

$$F = f(MC,I)$$
$$M = f(MC,I) \tag{3}$$
$$A = f(MC,I)$$
$$d = f(F,M,A) = f(MC,I)$$

Membership composition can either be homogenous or heterogenous but the information needed to reduce costs can be importantly influenced through homogeneity among members leading to I = f(MC). Therefore, we can state that osusu design can affect the services demanded by members so that repayment performance importantly depends on membership composition. Members can be homogenous or heterogenous in age, gender, occupation, work place, residence and ethnicity. But given that our sample is invariably composed of members homogenous in their ethnic background and work place, the characteristics that appear to influence information the most are homogeneity in age, gender and employment types. The latter also affects the level and regularity of the member's income. Specifically, the following propositions can be derived from the above discussion for empirical validation using the Gambian data:

Proposition 1: Member homogeneity in source of income has a negative effect on fund size. This is expected because while similarity in cashflows facilitates regular contributions by members, a

large covariance in cash flows will tend to decrease fund size when a region or occupation specific shock or disturbance occurs that affects many individuals simultaneously [13].

Proposition 2: Member homogeneity can increase the information available to members because accessing the available information and interpreting its implications will be easier for persons who are similar rather than different from each other. Therefore, membership size, M, is expected to be higher in groups with homogenous rather than heterogenous members [14]. However, with larger groups there is a possibility that the stronger members will crowd out the weaker ones in accessing group services. In addition, coinsurance among members will be reduced since group cohesiveness will likely be less in large groups. In places with no external insurance, the security offered by a group is valued highly by the members. This tendency would likely lead to smaller membership sizes for homogenous than for heterogenous groups. The net effect of homogeneity on membership size, therefore, is ambiguous.

Proposition 3: Homogeneity in income sources and level will lead to members choosing random rather than non-random methods of fund allocation methods [15]. This is due to the potential synchronization in demand for funds by members with similar preferences in a homogenous group. Therefore, randomness in pot allocation will be preferred to help prevent politically stronger members from overriding weaker ones in access to the pots.

Proposition 4: The effect of membership homogeneity on group performance measured by delinquency and default in member payments is ambiguous. While a high covariance risk among members in homogeneous compared to heterogenous osusus will lead to higher delinquency and default in member payments due to unforeseen and uninsured events, the availability of information among members will facilitate better screening and peer monitoring leading to lower default and delinquency rates due to moral hazard problems. Nonetheless, in close communities with no external insurance, covariance risks may more than offset informational advantages leading a homogenous osusu to experience low repayment rates.

These four propositions are tested in the following section.

IV. Econometric Estimation and Results

It is postulated that an osusu with a more homogenous membership composition will have a larger membership size, will intermediate smaller sized funds, will allocate funds using random rather than non-random methods, and will have poorer repayment performance compared to osusus composed of heterogenous members. Since the fund and membership sizes are continuous variables, a maximum likelihood estimate (MLE) procedure is applied to test the hypotheses. A

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[13] This is expected to be particularly relevant for farmers.

[14] See Slover, Curtis H., "Informal Financial Groups in Rural Zaire: A Club Theory Approach", Unpublished Ph.D. Dissertation, Columbus: Department of Agricultural Economics, The Ohio State University, 1991.

[15] See Besley, Timothy, Stephen Coate and Glenn Loury, "The Economics of Rotating Savings and Credit Associations", American Economic Review Vol. 82, June 1993, pp. 792-810.

binomial logit model is used to estimate the fund allocation equation (ROTATION TYPE) where the dependent variable takes the value of zero for a random method and one for non-random method of fund allocation. Also a binomial logit model is used to estimate the determinants of the probability of delinquency (default) where the dependent variable takes the zero value for non-delinquent (non-defaulted) osusus and one for delinquent (defaulted) osusus.

The explanatory variables include dummy variables for homogeneity in gender (GENDER), age (AGE) and employment type (EMPLOY) of the members, where the variables take the value one in the presence of homogeneity, and zero otherwise. The employment categories include dummy variables for civil service (CIVIL), farming (FARM), food retailing (FOOD), fruit and vegetable retailing (F&V) and tie-dye retailing (TIE-DYE).

Two reduced form models, one for all employment types and the other for the sample disaggregated by employment types, are estimated for each of the fund size, membership size and fund allocation equations. The regression results are presented in table 3. The results from both the models generally confirm the postulates presented above. Surprisingly, homogeneity in gender did not affect fund size, membership size and fund allocation methods in either of the models; similarly, homogeneity in age, gender and employment did not affect membership size and fund allocation methods under either model. Our results are consistent with a study whose results showed that homogeneity in gender and age does not significantly affect fund size and membership size in rotating and non-rotating informal groups in Zaire [16]. Income generating capacity and preferences of the members are generally affected by their age and employment type. Therefore, our hypothesis regarding the effect of homogeneity in member income generating capacity on size of funds intermediated is confirmed by the results in both models that show that homogeneity in age and employment tend to reduce fund size.

The results from model two in table 3 additionally show that while fund size is smaller in osusus composed of farmers, it is larger in osusus made of civil servants and tie-dye workers. Membership size tends to be smaller in osusus composed of civil servants compared to other employment types. The random method of pot allocation is chosen only by osusus homogenous in members employed in civil services and tie-dye selling. This result is consistent with previous studies that showed that RoSCAs that were formed among civil servants to purchase some indivisible good preferred a random lottery method of pot allocation [17].

Two reduced form equations are estimated for each of the determinants of delinquency and default in the osusus and the results are presented in table 4. The results in model 1 show that

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[16] See Slover, Curtis H., "Informal Financial Groups in Rural Zaire: A Club Theory Approach", Unpublished Ph.D. Dissertation, Columbus: Department of Agricultural Economics, The Ohio State University, 1991.

[17] See Besley, Timothy, Stephen Coate and Glenn Loury, "The Economics of Rotating Savings and Credit Associations", American Economic Review, Vol. 82, Jkune 1993, pp. 792-810, and Besley, Timothy and Alec Levenson, "The Role of Informal Finance in Household Capital Accumulation: Evidence from Taiwan", Research Program in Development Studies, Woodrow Wilson School, Princeton University, Working Paper, June 1993.

membership homogeneity does not affect delinquency and default of members. The results, however, do not adequately support postulate 4 laid out earlier but are consistent with a study that reported an insignificant correlation between membership homogeneity and delinquency rates among groups in Costa Rica [18]. In fact, the results showed that groups heterogenous in member income earning capacity and project rates of returns reported lower delinquency rates than homogenous groups. High delinquency rates were significantly related to weak leadership.

It is possible that delinquency and default rates are more directly affected by design elements than by membership composition. Therefore, an alternative specification was estimated using predicted values of design characteristics, obtained from model 1 presented in table 3, as explanatory variables. The results are presented as model 2 in table 4. The results support the above argument and suggest a two stage process wherein membership composition affects design features in the first stage which in turn affects repayment performance in the second stage. Delinquency and default rates increase with increases in fund size, membership size and non-random type of pot allocation.[19] The results lend support to the theoretical literature that predicts low repayment rates for larger loans and for groups composed of larger membership due to asymmetric information leading to increased moral hazard problems and reduced peer monitoring.[20] The positive and significant association between delinquency, default and non-random type of pot allocation may be attributed to the fact that there exists some free rider problem wherein some members tend to shirk their obligations once they have perfect knowledge on the time of their receipt of the pot.[21]

These results may be considered as first order approximations since several other variables besides homogeneity in membership composition are assumed constant in affecting membership

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[18] See Wenner, Mark, "Signalling of Credit Worthiness in Rural Credit Markets: An Analysis of Group Lending in Costa Rica", University of Wisconsin-Madison: Department of Agricultural Economics, Unpublished Ph.D. Dissertation, 1989. Measures of homogeneity included age, gender, ethnicity, civil status, years of residence in the community and education level.

[19] The results did not change when actual values for design features were used. This shows that dessign features incorporate the effects of membership composition.

[20] See Stiglitz, Joseph E., "Peer Monitoring and Credit Markets," World Bank Economic Review, Vol. 4, No. 3, September 1990, pp. 351-366. The Grameen Bank in Bangladesh provides small loans to small groups made up of five members and reports a loan repayment rate above 90%. See Pitt, Mark M. and Shahidur R. Khandker, "Household and Intrahousehold Impacts of the Grameen Bank and Similar Targeted Credit Programs in Bangladesh", Paper presented at the World Bank/BIDS sponsored workshop on Credit Programs for the Poor held in Dhaka, Bangladesh, March 19-22, 1995.

[21] While the non-random method gives greater chances for opportunistic behavior since the member can influence the timing of receipt of the pot, the random selection at each rotation prevents a 'hit and run' strategy.

size, fund size, fund allocation methods and repayment performance. However, structural models were tested with simultaneity among the fund size, membership size, fund allocation methods and repayment performance. Those results did not contradict the results obtained from the reduced form specifications presented in this paper. The independent variables in the structural models included variables, such as cycle length, number of years of continuous operation of the osusu, locality, and the number of new members added during the reference cycle from the previous cycle, in addition to the proxies for membership homogeneity. This may be due in part to the limited availability of independent variables that can be used as instruments in a simultaneous specification. Also the study is limited by a lack of information about leadership capabilities that can importantly affect loan repayments. Nonetheless, the reasonable fit of the models, and the efficient and consistent estimates obtained through MLE and logit procedures contributes statistical support to the propositions outlined above.

V. Conclusions and Policy Implications

Indigenously formed osusus provide valuable financial services to low income persons who have limited access to formal financial services in The Gambia. Recently, NGOs have become active in using existing indigenous osusus or creating new osusu-like groups to channel their financial services to villagers. Whereas traditional osusus are observed to be generally homogenous in their membership composition, NGOs are attempting to include heterogenous members in order to diversify the loan portfolios of their groups and to reduce default risks. But a mismatch between the design of NGO osusus and member interests could lead to unsustainable groups.

This paper examined if membership homogeneity affects the design features and repayment performance in 88 indigenous RoSCAs in The Gambia. The results show that homogeneity in gender is less likely to affect the size of funds intermediated, membership size and method of fund allocation compared to homogeneity in income generating capacity among members reflected in member age and employment types. In addition, while member homogeneity in employment types reduces fund size, the random method of pot allocation is chosen only by osusus homogenous in members employed in civil services. Therefore, the results suggest that NGOs can form mixed gender groups without contradicting the elements of design found in indigenous groups. Many advocates of special services for women, however, argue that men may dominate groups for their own benefit so they often support women-only groups. The issue of heterogeneity in occupation and age appears to be more crucial because increased homogeneity in both variables is associated with smaller fund size and random methods of fund allocation. This conclusion implies that the ease of obtaining and evaluating information about more homogenous group members is more than offset by the disadvantage of similar time preferences among similar aged members and high covariance in the demand for funds associated with similar occupations.

The results also suggest that group performance as measured by delinquency and default rates is more directly affected by design characteristics than by membership composition. Poor repayment performance was observed in osusus with larger fund size and membership size, and that used non-random methods of pot allocation. Membership composition seems to be an important concern in designing the groups in order to enhance the net benefits obtained from

participating in a group which consequently affects repayment performance and group sustainability.

These conclusions reached in this study may be unique to this particular sample and country observed during the limited study period. However, the study points out the need to carefully evaluate the characteristics of indigenous groups which contribute to their long-term sustainability. Introducing different characteristics in specially formed groups could introduce instability and destroy their efforts to achieve long-term sustainability. Much more needs to be known about the characteristics of indigenous groups and the factors that contribute to their durability before we can be confident that NGO created financial self-help groups are likely to become permanent, sustainable sources of financial services for the poor.

Table 1.   General Characteristics of the Sampled Indigenous RoSCAs in The Gambia [a]

Type of Osusu members	No. of osusus sampled	Ave.no. of members	Percent of female members	Ave. pot size per rotation (D)[b]	Pot allocation methods (percent of osusus reporting)		Delinquencies (percent reporting)		Defaults (Percent reporting)	
					Random	Non-random	Osusus	Members	Osusus	Members
Civil servants	8	15	87	2,690	75	25	13	2	0	0
Farmers	15	21	90	136	33	67	67	5	40	2
Food vendors	5	21	98	450	60	40	40	2	0	0
Fruit and vegetable vendors	52	23	89	535	60	40	27	4	8	0.3
Tie-dye sellers	8	21	95	2,150	75	25	63	8	13	1
Total	88	21	92	1,314	58	42	36	4	13	0.6

a. Indigenous RoSCAs are formed by the members themselves while NGO RoSCAs are formed by the NGOs.
b. Dalassi 8.52 = US $ One.

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Table 2.   Selected Statistics, by Delinquency and Default Status of Osusu Members.

Item	Delinquency status		Default status	
	Yes	No	Yes	No
Number of osusus	32	56	11	77
Average fund size (Dalassis)	2214 (5964)	828 ** (1317)	1090 (1075)	1346 * (3947)
Average number of members	28.8 (19.3)	19.9 ** (11.7)	33.1 (23.6)	21.7 ** (13.5)
Number of osusus with random pot allocation	15	36	4	47
Number of osusus with non-random pot allocation	17	20 } #	7 } #	30 } #

Standard deviation given in parentheses.

**, * represent significant difference *between* delinquent (default) and non-delinquent (non-default) osusus based on t-statistics at 5 and 10% levels, respectively.

represent significant difference *within* delinquent, defaulted, non-delinquent and non-defaulted osusus based on t-statistics at 10% level.

Table 3.   Regression Results for Determinants of Fund Size, Membership Size and Fund Allocation Methods in Indigenous RoSCAs in The Gambia

Variables [a]	Fund Size (MLE)		Membership Size (MLE)		Fund Allocation Method (Logit) (Non-random = 1)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Constant	4195.9*** (1738.1)	792.2*** (247.9)	18.69*** (7.6)	20.12** (8.8)	-0.71*** (0.52)	-0.182 (0.268)
GENDER	-153.4 (141.4)	-142.1 (136.1)	3.646 (6.2)	3.87 (6.1)	-0.72 (0.57)	-0.63 (0.53)
AGE	-2376.3*** (781.1)	-420.9 (969.1)	2.04 (3.4)	1.68 (2.2)	0.69 (0.65)	0.39 (0.28)
EMPLOY	-1514.9* (927.1)		-0.44 (4.1)		0.27 (0.32)	
F&V		231.70 (238.1)		1.02 (6.1)		-0.32 (0.44)
FARM		-5.348*** (2.5)		5.12 (8.7)		0.49 (0.32)
CIVIL		253.61*** (151.3)		-8.55* (6.4)		-0.29** (0.14)
TIE&DYE		161.28** (111.3)		2.95 (8.4)		-0.48** (0.22)
R^2/log-likelihood	0.43 -871.1	0.46 -858.5	0.82 -3766.8	0.45 -374.9	-60.7	-52.86
Chi-square					15.6 **	15.5 **

Asymptotic standard errors are presented in parentheses.
***, ** and * represent significance at 1,5 and 10%, respectively.

a. All independent variables are expressed as dummy variables where homogeneity is represented by 1.

Table 4.   Logit Regression Results for Determinants of Delinquency in Indigenous RoSCAs in The Gambia

Variables	Delinquency		Default	
	Model 1	Model 2 [a]	Model 1	Model 2 [a]
Constant	-0.98	-2.22***	-3.72**	-3.28***
	(1.3)	(0.6)	(1.7)	(0.8)
GENDER	1.10		-0.04	
	(1.1)		(1.1)	
AGE	-0.38		-1.03	
	(0.5)		(0.8)	
EMPLOY	-0.59		-1.12	
	(0.5)		(1.1)	
FUND SIZE		0.34*		0.31*
		(0.1)		(0.1)
MEMBERSHIP SIZE		0.48***		0.54**
		(0.1)		(0.2)
ROTATION TYPE (NON-RANDOM)		0.87*		0.82*
		(0.4)		(0.4)
Log-likelihood	-114.6	-103.11	-63.99	-69.31
Chi-square	3.45	13.51**	2.74	8.65*

Asymptotic standard errors are presented in parentheses.
***, ** and * represent significance at 1,5 and 10%, respectively.

a.   Model uses predicted values of fund size, membership size and rotation type obtained from model 1 presented in table 3.

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