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CONTRIBUTION OF UMURENGE SACCOs ON FINANCIAL INCLUSION OF WOMEN ENTREPRENEURS IN RWANDA – A CASE EVIDENCE FROM NYAMASHEKE DISTRICT, RWANDA

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Abstract:
The study titled "*Contribution of Umurenge SACCOs on financial inclusion of women entrepreneurs in Rwanda - A case evidence from Nyamasheke District*" was about assessing the impact of Umurenge SACCOs as microfinances on the financial inclusion of women entrepreneurs in the area under study. The study was guided by three objectives, firstly to determine the contribution of Umurenge SACCOs on the financial inclusion of women entrepreneurs in Rwanda, second to assess the main factors influencing the financial inclusion of women entrepreneurs in Nyamasheke District and third to test whether there is a significant difference in means of women entrepreneurs' income before and after joining the financial services delivered to them by Umurenge SACCOs. In this regard, the Multinomial Logistic Regression model was performed using a maximum likelihood estimation method on the data set collected to find the parameter estimates of the model describing the relationship between the explanatory and the outcome variables and determine the significance of the predictor variables that contribute significantly to the financial inclusion of women entrepreneurs in the area under study. The study adopted both qualitative and quantitative approaches to collect data from 395 respondents. Data

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were collected using a questionnaire and analyzed using SPSS-23. In this analysis, the results revealed that on the total of eleven independent variables that we thought to contribute to the outcome variable, the explanatory variables such as age group, income, living place/location, political factor and payment of social security/type of the job of the respondents to whom the study was conducted; were dropped from the training set of explanatory variables that contribute significantly to the financial inclusion of women entrepreneurs in Nyamasheke District, Rwanda. In the model selection that overall fits well the data, the explanatory variables that contributed significantly to the outcome variable governing the study were obtained to be were *education status*, *formal accounts*, *formal savings, formal credits, attractiveness of the financial products and type of job* that the respondents under study possess. The parameters estimate of the selected model revealed that the predictor variables that best predicted the probability of increasing the financial inclusion status of women entrepreneurs in the area under study were education level of respondents, formal credits, formal savings and attractiveness of the financial products that Umurenge SACCOs possessed. The study also found that there was a significant difference in means of women entrepreneurs' income before and after joining the financial services delivered by Umurenge SACCOs and finally recommended that the microfinance institutions should strengthen the policies governing the formal savings, formal credits and financial products which are attractive towards the financial performance of entrepreneurs.

Keywords: Umurenge SACCOs, entrepreneurs microfinance institution, cooperatives, financial inclusion

1. Introduction

1.1 Background information

First of all, Umurenge SACCOs were founded in 2008 with the intention of increasing rural savings and offering Rwandans loans to help them increase their income and improve their standard of living. According to the Fin Scope 2008 and 2012 polls, 21% of Rwandans who were 18 years old or older used formal financial institutions in 2008. Umurenge SACCO had been very important in Rwandan women's life by raising their capital by giving those loans and offering them savings. The SACCO was accepted by the Ministry of Commerce, Industry and Tourism as a cooperative on 21st June 2006 and given a license to operate by the Central Bank (BNR) on 22nd February 2008.

The history of the savings and credit cooperative dates all the way back to 1938. There were just three SACCOs known at independence. The Grameen Bank was founded in Bangladesh in 1976, which marked the beginning of the savings and credit cooperative industry that is being practiced today. As a result of concerns and study in the nation on the provision of subsidized credit to farmers without means, it gained popularity in the 1980s. Prior to the 1980s, government agencies dominated the market for providing useful credit to people who had never had access to credit facilities (Ledgerwood, 1999)

Many microfinance NGOs (Non-Governmental Organizations) were founded in the 1980s and 1990s, primarily in Asia, Africa, and Latin America, to offer microloans utilizing both individual and group lending approaches. While many of the NGO5 in the 1990s failed to grow or become financially sustainable, others paved the way by proving that microfinance lending savings and other financial services to the poor is a viable approach to assist poor people manage risk, acquiring assets, and escaping poverty. Microfinance organizations have recently developed creative methods for providing lending and savings services to the entrepreneurial poor over the past ten years. According to proponents of the income-generation method, credit should primarily be given to the poor who are also entrepreneurs so they can fund specific private income-generating activities and boost their revenues (Daley-Harris & Sam, 2002)

The microfinance sector has grown significantly over the past 20 years. Microfinance is an efficient means of fostering long-term, sustainable, and economic growth. According to Richard Weingarten, United Nations Capital Development Fund: Microfinance Matters, building inclusive financial sectors 2005, it has evolved into a crucial tool for national governments and major international development organizations to promote local economic development and to encourage and support private sector development at the earliest stages (Tony Lawson, 2006). One of the world's developing nations, Rwanda is a small, landlocked nation in Central Africa that is part of the Great Lakes region of Africa. More than 90% of the population depends on subsistence agriculture, which is the foundation of its economy. Although only making up 40% of the GDP, agriculture accounts for 90% of export earnings. With one of the fastest rates of population increase at 2.9% annually, Rwanda's population was expected to be over 9,2 million in 2008. The percentage of people living in poverty has increased to almost 60%, while income disparity has gotten worse (MINECOFIN, 2006).

According to Gatete (2000), political and social issues in Rwanda had undermined the country's financial condition, which led to a sharp contraction of the country's monetary economy as well as a reduction in financial intermediaries and a loss of financial depth. After the 1994 Tutsi genocide, which left the entire nation in a state of abject poverty, the Rwandan government launched a number of initiatives aimed at fostering economic growth in the nation. The government began implementing the Green Revolution program in the early years after 1994 in an effort to promote the growth of agriculture in the nation because many Rwandans made their living from farming (Williams, 2005).

Despite all of these efforts, there is still more to be done to improve the economic situation of citizens. This viewpoint led to numerous projects and legislation that viewed financial access as a means of fostering personal growth. However, a different analysis was done, and it was determined that grouping into cooperatives was best for the above-mentioned aim. Since 1997, the system of cooperative development has steadily transformed into uncountable unofficial groups with a cooperative goal, that is, organizations that have not yet fully complied with the prerequisites for recognition as

cooperative groups (Angelique, 2009). Many formal micro-financial services emerged as a result of the same rules, competing with commercial banks (Angelique, 2009).

In a similar vein, the Rwandan government has been enticing these cooperatives to collaborate with financial institutions in order to empower themselves through saving and credit cooperatives, as well as the Vision 2020 development agenda, which aims to increase people's access to financial services for their development. Rwanda encourages people to form cooperatives even if the majority of them continue to live in poverty (Francine, 2018).

Saving and credit cooperatives (SACCOs) are nothing new in Rwanda, where numerous small SACCOs and the "Banque Populaire du Rwanda" (BPR) have been in operation for many years. However, the coverage of SACCOs is still very low, with only 3% of the population saving through all MFIs in general, SACCOs included. The National Dialogue Summit held in December 2008 advocated the establishment of at least one SACCO at the level of each Sector to address this issue, which was identified as a significant barrier to people's economic progress. In accordance with this, a task force made up of members of several government institutions was established with the mandate to develop a strategy (www.rca.gov.rw). This dissertation will undertake to study of the contribution of Umurenge SACCO to the financial inclusion of women entrepreneurs in Rwanda.

Rwanda was in ruins after the war concluded in July 1994. Millions of people were uprooted, its fundamental infrastructure was devastated, and many Tutsis who survived had lost their relatives. The ramifications of rape and sexual assault were felt by many women. This also has affected Rwandan citizens in terms of economy. Women had to be raised from ashes in other to stand on their own. Rwandan women entrepreneurs had very serious problems of where to find capital to do their businesses so that they can survive. Microfinance activities were not very substantial in Rwanda before to the 1994 genocide, save from the "Banques Populaires" and a few Organizations that provided financial services to the people. Following 1994, aid organizations and donors stepped in amid the Rwandan people's dire need. Loans were sometimes not distinguishable from grants or gifts during the emergency period, which led to confusion among the general public.

The first "People bank" (Banque Populaire) was established in 1975 at NKAMBA in the Northern Province, Burera District, even though microfinance activities had been in Rwanda for a long time with the system of self-help groups, known locally as IBIMINA. The researcher is concentrating on issues that affect the government of Rwanda in the context of MFIs' contributions to reducing poverty through access to financial services by empowering and promoting people in light of the current situation, in which the current population only uses financial services that are already available (2%) and the total coverage of MFIs (14%), respectively (MINECOFIN, 2006) It's from this regards that the researcher developed interest on this topic 'contribution of Umurenge SACCO on financial inclusion of women entrepreneurs in Rwanda' – a case evidence from

Nyamasheke district'. General objective is to assess the contribution of Umurenge SACCO on financial inclusion of women entrepreneurs in Rwanda.

2. Theoretical Review

2.1 Theoretical Approach

This research underpinned on some relevant and interesting theories of the field of entrepreneurship that have been conceptualized within empirical research evidence. These theories are economic entrepreneurship theory, Anthropological entrepreneurship theory, Opportunity based-entrepreneurship theory, Resource-based entrepreneurship theory, Psychological Entrepreneurship theories, Sociological Entrepreneurship theory and Entrepreneurship theory of Shane.

2.1.1 Economic Entrepreneurship Theory

Economic entrepreneurship theory has deep roots in classical and neoclassical theories of economics, and the Australian Market Process (AMP). These theories explore the economic factors that enhance entrepreneurial behavior (Simpeh, 2010).

2.1.2 Classical Theory

The classical theory extolled the virtues of free trade, specialization, and competition (Ricardo, 1817) and lasted until the 1830s. The classical movement described the directing role of the entrepreneur in the context of production and distribution and a competitive marketplace (Say, 1803). Classical theorists articulated three modes of production: land, capital and labor. These have been objections to the classical theory. These theories failed to explain the dynamic of upheaval generated by entrepreneurs of the industrial age (Murphy, Liao & Welsch, 2006)

In relation to this theory, our research could come up with an agreement that women may combine the said three modes of production land, capital and labor. And in the collection to the objections to this theory, women should develop their entrepreneurial spirit.

2.1.3 Neo-classical Theory

The neo-classical theory emerged from the criticisms of the classical model and indicated that economic phenomena could be relegated to instances of pure exchange, reflect an optimal ratio, and transpire in an economic system that was basically closed. The economic system consisted of exchange participants, exchange occurrences, and the impact of the results of the exchange on other market actors. The importance of exchange coupled with diminishing marginal utility created enough impetus for entrepreneurship in the neoclassical movement (Murphy, Liao & Welsch, 2006)

In the context of this economic entrepreneurship theory, in this research study, I admit that women, helped by microfinance institutions services, can develop themselves through the products of their entrepreneurial activities

2.2 Psychological Entrepreneurship Theories

The level of analysis in psychological theories is the individual (Landstrom, 1998). These theories emphasize the personal characteristics that define entrepreneurship. Personality traits needed for achievement and locus of control are reviewed and empirical evidence is presented for three other new characteristics that have been found to be associated with entrepreneurial inclination.

These are risk-taking, innovativeness, and tolerance for ambiguity. In psychological entrepreneurship theories, the following theories are included: Personality Traits theory, Locus of Control, Need for Achievement theory (Simpeh, 2010).

2.2.1 Personality Traits Theory

Defines the personality as "*sable qualities that a person shows in most situations*" to the trait theorists there are enduring inborn qualities or potentials of the individual that naturally make him an entrepreneur (Coon, 2004).

2.2.2 Locus of Control

The concept was first introduced by Julian Rotter in the 1950s. Rotter (1966) refers to Locus of control as an individual's perception of the underlying main causes of events in his/her life. In other words, a locus of control orientation is a belief about whether the outcomes of our actions are contingent on what we do (internal control orientation) or events outside our or on events outside our personal control (external control orientation) in this context, the woman entrepreneur's success comes from her own abilities and also support from outside.

2.2.3 Need for Achievement Theory

The need for achievement theory by McClelland (1961) explained that human beings have a need to succeed, accomplish, excel or achieve. Hence women entrepreneurs should be driven by this need to achieve and excel in their entrepreneurial activities.

In our research study, we agree with all the above three psychological entrepreneurship theories (personality traits theory, locus of control and need for achievement theory). For women entrepreneurs to succeed in their entrepreneurial activities, they need to use their personal entrepreneurship skills that should be supported by microfinance institutions.

2.3 Sociological Entrepreneurship Theory

The sociological theory is the third of the major entrepreneurship theories. The sociological enterprise focuses on the social context. In other words, in sociological theories, the level of analysis is traditionally the society (Landstrom, 1998).

Referring to this sociological entrepreneurship, I suggest that women entrepreneurs must develop positive strong moral behaviours that allow them to socially cooperate with their stakeholders. Microfinance institutions are involved in developing

the sense of integrity of women entrepreneurs through training and hence these women become aware of how to behave in the society in which they operate.

2.4 Anthropological Entrepreneurship Theory

The fourth major theory is referred to as the anthropological theory.

Anthropology is the study of the origin, development, customs, and beliefs of a community. In other words, the culture of the people in the community. The anthropological Theory says that for someone to successfully initiate a venture the social and cultural contexts should be examined or considered.

According to this anthropological entrepreneurship theory, in my research, I bring an idea that women should develop customs of working hand in hand with microfinance institutions by continually fulfilling their responsibilities.

2.5 Opportunity-Based Entrepreneurship Theory

The opportunity-based theory is anchored by names such as Peter Drucker and Howard Stevenson. An opportunity-based approach provides a wide-ranging conceptual framework for entrepreneurship research (Fiet, 2002; Shane, 2000). Entrepreneurs do not cause change (as claimed by the Schumpeterian or Austrian school) but exploit the opportunities that change (in technology, consumer preferences, etc.) create (Drucker, 1985).

On our point of view, this theory of opportunity-based entrepreneurship theory is too much helping my research study since microfinance institutions services are the most opportunities for women entrepreneurs who have a shortage of financial capital.

2.6 Resource-Based Entrepreneurship Theories

The resources-Based theory of entrepreneurship argues that access to resources by founders is an important predictor of opportunity-based entrepreneurship and new venture growth (Alvarez & Busenitz, 2001). Access to resources enhances the individual's ability to detect and act upon discovered opportunities (Davidson & Honing, 2003). Financial, social and human capital represents three classes of theories under the resources-based entrepreneurship theories.

2.7 Financial Capital/Liquidity Theory

Empirical research has shown that the founding of new firms is more common when people have access to financial capital (Blanchflower, D., Oswald, A., & Stutzer, 2001, Evan & Jovanovich, 1989, and Holtz-Eakin, D., Joulfaian, D., & Rosen, H, S, 1994). By implication, this theory suggests that people with financial capital are more able to acquire resources to effectively exploit entrepreneurial opportunities, and set up a firm to do so (Clausen, 2006).

2.8 Social Capital or Social Network Theory

Entrepreneurs are embedded in a larger social network structure that constitutes a significant proportion of their opportunity structure (Clausen, 2006). Shane and Eckhardit (2003) say "*an individual may have the ability to recognize that a given entrepreneurial opportunity exist, but might lack the social connections to transform the opportunity into a business startup*". It is thought that access to a larger social network might help overcome this problem.

2.9 Human Capital Entrepreneurship Theory

Underlying the human capital entrepreneurship theory are two factors education and experience (Becker, 1975). The knowledge gained from education and experience represents a resource that is heterogeneously distributed across individuals and in effect central to understanding differences in opportunity identification and exploitation (Anderson & Miller, 2003, Chandler & Hanks, 1998, Gartner, W. B., Shaver, K. G., Carter, N. M., & Reynolds, 2005, Shane & Venkartaraman, 2000)

This theory of resource-based entrepreneurship theory is encouragingly lighting my research as in their entrepreneurial activities; women entrepreneurs need all of financial, social and human capital for succeeding in their day-to-day entrepreneurial activities.

2.10 Entrepreneurship Theory of Shane

Cited by Isidore (2010), the theory consists of opportunity discovery, evaluation of the opportunity and the decision to exploit the opportunity. Other elements of the theory include self-employment, business operation and performance.

The theory highlighted four operational measures of performance which are survival, growth, profitability/income, and experiencing initial public offering. Survival refers to the continuation of entrepreneurial activity while growth refers to an increase in the venture's sales and employment. Profitability refers to a new surplus of revenue over cost while experiencing an initial public offer refers to the sale of stock to the public (Shane, 2003).

Entrepreneurs' ability to identify and tab such opportunities differs between entrepreneurs. It also depends on their ability to access information and willingness to act upon the information in terms of risk; that is their attitude (Shane, 2003).

Individual attributes affect the discovery of entrepreneurial opportunities. It is made up of psychological and demographic factors such as motives, attitude to risk, education and training, career experience, age and social status.

Among the cited theories, this research is more lighted by the Entrepreneurship theory of Shane which consists of opportunity discovery, evaluation of the opportunity and the decision to exploit the opportunity. Within this research, the opportunities are services offered by Umurenge SACCO, Ltd, namely credits, savings and training services. For this research, the conceptual framework can be summarized as follows:

2.11 Empirical Review

a. Savings

Saving is indispensable to investing. It is very vital for a SACCO to understand the needs and interests, priorities of existing and powerful clients. This serves well in time after knowing the interests of saving sensitization (Saving and Credit Workshop, Musanze, 2003). This will empower them to give the best services to their clients. This statement is supported by a number of other researchers like Dr. Alfred Hanning (1993) on page 5 in his paper entitled, "Mobilizing Savings", he says that microfinance needs to give a wide range of saving products that are oriented to a particular client. This enables clients to have a choice between immediately accessible, liquidity products or semi-liquid accounts or time deposits with higher interest rates. According to the Grameen Bank model, there is an emphasis on savings as a prerequisite to access loans where clients should access the savings at any time. However, these savings always act as security and clients cannot access it at any time they wish. If the savings requirement is very high then members who cannot meet the stated amounts are automatically pushed out of the loan program.

b. Savings/Deposit

services deposits and related services supported saving regularly in society though the savings are small in amount. This directs each client to accumulate savings for the expected and unexpected demand. The deposits may be extracted according to the conditions under which the accounts were contracted and classified. Liquid accounts demand deposits. These are deposits that allow money to be deposited and withdrawn at any time. Usually, there is no interest rate paid and they require substantial bookkeeping. There is no stable source of money. Only a limited portion can be used to provide credits. conditions involved in this account are that one must join the SACCO and have an ordinary saving account, there is always a minimum amount of money set to open and on closing account, there is no interest paid on savings, extractions are not limited and there is no monthly fee paid and no minimum balance and number of deposits are not limited.

c. Semi-liquid Accounts

These are deposits that allow some liquid money and some returns. Clients can withdraw funds for a limited number of times and return it at any given time. A nominal rate of benefits is paid based on the minimum balance in the account over a given period that is monthly, yearly and so on. This motivates a client to hold a certain amount of money on the account. Conditions involved in this account are that must be a member of the SACCO, a minimum amount is set to open an account, there is always a minimum balance set, interest rate calculation is calculated on a minimum monthly balance, the number of deposits are not limited and number of withdraws are limited.

d. Fixed-term Deposit

The savings accounts are locked in for specific amount of time. They provide lowest liquidity to the member but highest return in the form of interest. They are stable sources of funding for a SACCO which pays the highest rate of return to months or years. Fixed-term deposits range from one month to several years. Earning competitive rates of 10 interests and minimizing financial problems on such savings. In savings and credit, cooperative clients are the old age saving insurance. This is a service that was introduced by RCA newly introduced in SACCOs; it includes locking in savings for a period of more than ten years. The savings are entrusted by Liberty insurers (East African underwriters) who invest it and are capable to pay interest rate well over and above the inflation rate plus life cover of one hundred and fifty thousand Rwandan Francs for every one hundred thousand Rwandan Francs saved in installments of five thousand Rwandan francs every time one saves (RCA Training Manual, 2005). Insurance services; in savings and credit transactions in Rwanda, like any other SACCOs worldwide, members are availed of insurance services. This basically covers the savings and credits of clients. A saving and credit cooperative can operate various kinds of funds or accounts according to the needs of the clients. However, there are the main funds, which form the core of the savings and credit cooperative shares. To use the services of the cooperative savings and credit society, clients must stake in the business by buying shares. On obtaining shares in a cooperative, one automatically enjoys ownership rights in the institutions. These shares form the cushion and become risk capital in case of business loss. Basically, these shares are used to obtain fixed assets and obtain shares and financial investments in other organizations. Shares gain dividends at the end of the financial year and they are not withdrawn able but they are transferable. Microfinance and savings banks are often very far away or the time and process needed to accomplish transactions are too erroneous. These institutions also may impose minimum transaction sizes and require depositors, to retain a minimum balance, both of which cannot put out the poor depositors, nor are they welcome as clients. Ahimbisibwe (2007), on strategies to increase savings culture, mentioned that it is necessary to teach people about the conditions and role of savings, give rewards to the best savers, make savings compulsory, and save for old age insurance and payment of interest above the inflation rate. Wright et al. (1997) also state that the wish and capability of the poor to save, when met with flexible and responsive saving facilities can end up with large-scale savings mobilization. Of course, voluntary, open-access savings schemes can generate more net savings per client per year than compulsory locked in savings schemes. And give an important and well-used facility for clients while doing so introducing a secure, liquid convenient savings facility that produces a positive rate of return can result in startling increases in members base and capital mobilization for the SACCO.

e. Objectives and Benefits of Microfinance Services in Rwanda

In order for MFI5 to effectively fulfill its role as partners in achieving local, regional, and international development goals, the government of Rwanda intends to foster a climate

that is supportive of professionalism and sustainability. This will be accomplished through providing financial and non-financial services to poor and low-income persons who are economically active and live in rural and urban areas (MINECOFIN; Microfinance Policy Document, 2007).

f. Microfinance Policy Objectives

- to provide a legal, regulatory, institutional, and economic climate that is favorable to Rwanda's microfinance industry's healthy development;
- to promote the growth of sustainable, expert MFI5 that provides a better range and quality of goods and services;
- to make it easier for Rwandans to obtain more financial services, particularly for those social groups that had not previously had access to traditional financial services, such as women; increasing individual financial and investment capacity while empowering women;
- to promote the emergence of national expertise in the field of microfinance that is able to serve as a model in the sub-region; to mobilize resources;
- to instill a financial culture in the populace, and to capitalize or monetize the rural sector in order to ensure equitable distribution of financial institutions and resources.

The microfinance industry has about 230 institutions active in it in June 2005, including 149 people's cooperatives, according to MINECOFIN (2007). The geographic distribution of MFI5 is uneven, with a greater concentration in metropolitan regions and some trade centers. In addition, BNR and the Ministry of Finance and Economic Planning (MINECOFIN) conducted nationwide education programs in conjunction with the application procedure for BNR approval, which began in 2004 and intensified in 2005. Several MFI5 that did not adhere to regulations were shut down at the end of 2005 and the beginning of 2006, and the process of their liquidation has started.

It should be noted that several MFI5 are part of an organization called Rwanda Microfinance Forum (RMF), which aims to provide as a platform for microfinance practitioners and their partners. It does not, however, belong to the majority of the MFI5 and is not a powerful entity. Also, three legal statuses—cooperatives, societes anonyme (S.A), and societes a responsibilite limiteeare recognized in order for MFIs to exist (SARL). Moreover, there are unofficial status possibilities for microfinance interventions, most notably tontines (rotating associations), also known as IBIMINA.

2.12 The Benefits of Microfinance/ Umurenge SACCO

According to Vision 2020 of Rwanda's document, the main benefits of microfinance are: Its capacity to lessen vulnerability among the poor is a reduction in vulnerability to unfavorable situations. There are numerous channels through which the decrease happens. Microcredit programs assist borrowers in accumulating household assets that can be sold, if necessary, in order to protect themselves against catastrophes. When dealing with businesspeople or more established lending institutions, they can also be utilized as security or proof of creditworthiness. A family that depends on share-

cropping may be easily driven into bankruptcy by the loss of a single crop, whereas a family with a diverse field base of crops and livestock or handicraft income may be able to survive the next harvest. Other aspects of micro credit program such as skills training and female empowerment also contribute to a family can make to challenge situation. These reductions in vulnerability are important because they allow the poor to begin to hold their own in society, gains made in prosperous times are partially protected during bad times, and the cycle of poverty is arrested.

Increased household consumption is another advantage of the microcredit program. In Bangladesh, for example, household consumption increases by 18 take for every 100 takes (the local currency) given to a female borrower. Income smoothing, which results from reduced vulnerability, also boosts consumption. Each of these consequences is significant for those who frequently reside close to a disaster. Better health and nutrition can result from even slight increases in consumption, as well as an improvement in the capacity to set long-term planning for the family. Such stability can have far-reaching positive benefits on participating households, especially when combined with the investment opportunities made possible by further loans from micro credit programs.

Income poverty is lessened thanks to microcredit schemes; over time, borrowers actually tend to earn more money. once the cycle of poverty has been broken and stability has been established. Several borrowers go on to develop profitable investments and even escape poverty collectively.

Financial services are accessible, which helps low-income people better control the expansion and diversification of their businesses. A progressive increase in loan size as borrowers become eligible for larger loans allows borrowers to start with smaller loans in the beginning (Robinson and Marguerite, 2002).

Developing self-esteem: microfinance institutions help to create the example that many disadvantaged households are well-regarded and deserving of trust by demonstrating respect for the client and showing confidence in their business. This role is particularly crucial in societies where certain groups of people are routinely oppressed by those who are regionally dominant due to their ethnicity, religion, gender, occupation, or other characteristics. Financial services enable the underprivileged to expand their economic activities, increase their income, and accumulate assets, which boosts their self-confidence at the same time.

Microfinance is important because it gives poor households more options and self-confidence by enabling them to expand their businesses and those of others, reduce risk, smooth out consumption, get high returns on investments, improve management, boost productivity and income, safely store excess liquidity, get a return on savings, avoid or minimizing exploitation by the powerful in their community, and conduct business (Robinson & Marguerite, 2002).

3. History of Umurenge SACCO

Umurenge SACCOs is the abbreviation for small-scale savings and credit cooperatives, or Umurenge SACCOs, were established in 2009 in each administrative division of Rwanda. They comprise 416 autonomous entities overall, providing services to 2.7 million members. small-scale savings and credit cooperatives, or Umurenge SACCOs, were established in 2009 in each administrative division of Rwanda. They comprise 416 autonomous entities overall, providing services to 2.7 million members.

Umurenge SACCOs were founded in 2008 with the intention of increasing rural savings and offering Rwandans loans to help them increase their income and improve their standard of living. According to the Fin Scope 2008 and 2012 polls, 21% of Rwandans who were 18 years old or older used formal financial institutions in 2008.

3.1 Vision of Umurenge SACCOs

The organization is devoted to assisting shareholders and partners to improve socially and economically while also doing its part to help Rwandans out of poverty. hence improving the quality of life for Rwandan families.

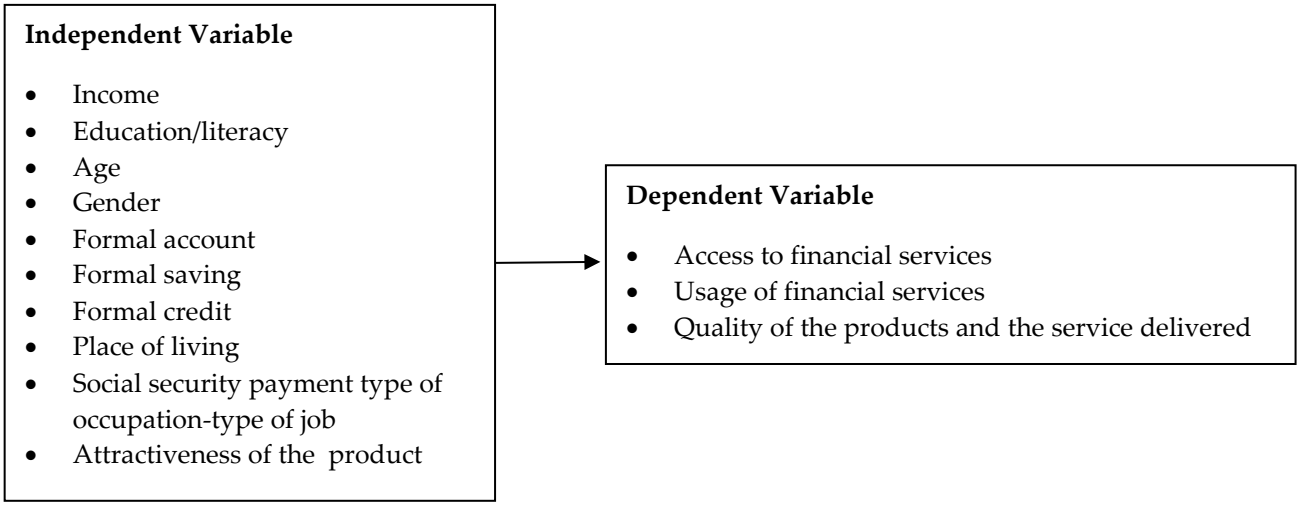
3.2 Mission of Umurenge SACCOs

According to its statute, Umurenge SACCOs 's goal is to support and stimulate the initiative of the Rwandan population who do not have access to financial services in general and, in particular, to enhance the social and economic well-being of shareholders. It also aims to boost up rural savings and provide Rwandans with loans to improve their earnings and enhance their livelihoods.

3.3 Objectives of Umurenge SACCOs

The goals of Umurenge SACCOs include encouraging a culture of saving, enhancing clients' ability to take the initiative to plan and carry out small business projects, and financing clients' ventures in order to provide job possibilities that would boost economic growth. The main goal of a savings and credit cooperative society (SACCO), a member-owned financial cooperative, is to mobilize resources and offer members with access to loans (both productive and provident) on favorable terms in order to improve their socioeconomic well-being.

4. Conceptual Framework



5. Research Objectives

The purpose of the paper is to:

- Assess the contribution of Umurenge SACCOs on financial inclusion of women entrepreneurs in Rwanda, especially in Nyamasheke District.
- Test whether there is was a significant difference in mean of income of women entrepreneurs of Nyamasheke District before and after joining Umurenge SACCOs.
- Identify the main factors influencing financial inclusion status of women entrepreneurs of Nyamasheke District.

From the overview of the above research objectives of the study, the hypothesis governing the study is:

H_0: There is no association between Umurenge SACCOs and financial inclusion status of women entrepreneurs of Nyamasheke District.

H_a: There is association between Umurenge SACCOs and financial inclusion status of women entrepreneurs of Nyamasheke District.

6. Methods and Materials

This study used a target population of 31407 women entrepreneurs who borrowed money from SACCO for the purpose of their small and medium enterprises from which a sample has been drawn using of Slovin's formula (Altares, et al. 2003) for sample size computation as follows:

$$n = \frac{31407}{1+31407(0.05)^2} \approx 395,$$

with n being the sample size to be selected in the targeted women entrepreneurs from all 15 branches of Umurenge SACCO of Nyamasheke District comprising 31407 women who work with Umurenge SACCO in Nyamasheke District having and the level of significance used in this study was 5% (cut off). Then simple random sampling was used to select the individuals to be included in the sample. After having this sample size, primary data were collected using questionnaire and interview guide and multinomial logistic regression model was used to model the outcome variable under study using the independent variables.

6.1 Brief Introduction on Multinomial Logistic Regression Model

The multinomial logistic regression (MLR) model is a generalization of the binary model and both models depend mainly on logit regression (Abdallah, 2012). Logistic analysis in the logistic regression can be extending to models with multiple explanatory variables. Let consider the case of k predictors for a binary response Y by $x_{1,}x_{2,}, \ldots\ldots x_{k,}$ the model for log odds is

$$Logit[p(Y=1)] = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_k x_k.$$

And the alternative formula, directly specifying $\pi(x)$, is

$$\delta(x) = \frac{\exp\left(\alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_k x_k\right)}{1 + \exp\left(\alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_k x_k\right)}$$

The parameter $\alpha_i$refers to the effect of $x_i$on the log odds that Y = 1, controlling otherx_j, for instance, $exp(\alpha_i)$ is the multiplicative effect on the odds of a one unit increase in x_i, at fixed levels of x_j.

If there are m independent observations with q-explanatory variables, and the qualitative response variable has k categories, to construct the logits in the multinomial case, one of the categories must be considered the base level and all the logits are constructed relative many ways is the natural complement of ordinary linear regression whenever the response is categorical variable. When such discrete variables occur among the explanatory variables, they are dealt with by the introduction of one or several $(0, 1)$ dummy variables, but when the response variable belongs to this type, the regression model breaks down. Logit analysis provides a ready alternative. For a response variable Y with two measurement levels (dichotomous) and explanatory variable X, let: $\delta(x) = p(Y=1|X=x) = 1 - p(Y=0|X=x)$, the logistic regression model has linear form for logit of this probability

$$Logit[\delta(x)] = \log\left(\frac{\pi(x)}{1-\pi(x)}\right) = \alpha_0 + \alpha_1 x,$$

where the $odds = \frac{\delta(x)}{1-\delta(x)}$.

The $odds = e^{(\alpha_0+\alpha_1 x)}$, and the logarithm of the odds is called logit, so:

$$Logit[\delta(x)] = \log\left(\frac{\delta(x)}{1-\delta(x)}\right) = \log[\exp(\alpha_0 + \alpha_1 x)] = \alpha_0 + \alpha_1 x\,.$$

The logit has linear approximation relationship, and logit = logarithm of the odds. The parameter α is determined by the rate of increase or decrease of the S-shapedcurve of $\delta(x)$. The sign of α_1 indicates whether curve ascends ($\alpha_1 > 0$) ordescends ($\alpha_1 < 0$), and the rate of change increases as $|\alpha_1|$ increases.

6.2 Multinomial Logistic Regression

The logistic regression can be extending to models with multiple explanatory variables. Let consider the case of k predictors for a binary response Y by $x_{1,}x_{2,}, \ldots\ldots x_{k,}$ the model for log odds is

$$Logit[p(Y=1)] = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_k x_k.$$

And the alternative formula, directly specifying $\pi(x)$, is

$$\delta(x) = \frac{\exp(\alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_k x_k)}{1 + \exp(\alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \cdots + \alpha_k x_k)}$$

The parameter $\beta_i$refers to the effect of $x_i$on the log odds that Y =1, controlling otherx_j, for instance, $exp(\alpha_i)$ is the multiplicative effect on the odds of a one unit increase in x_i, at fixed levels of x_j.

If there are m independent observations with q-explanatory variables, and the qualitative response variable has k categories, to construct the logits in the multinomial case, one of the categories must be considered the base level and all the logits are constructed relative to it. Any category can be taken as the base level, so we will take category k as the base level. Since there is no ordering, it is apparent that any category may be labeled k. In this case we let δ_j denotes the multinomial probability of an observation falling in the j^{th} category, to find the relationship between this probability and the m explanatory variables, $X_{1,}X_{2,}, \ldots\ldots X_{q,}$ the multiple logistic regression model is then

$$\log\left(\frac{\delta(x_i)}{\delta_k(x_i)}\right) = \alpha_{0i} + \alpha_{1j}x_{1i} + \alpha_{2j}x_{2i} + \cdots + \alpha_{qj}x_{qi},$$

where $j = 1, 2, \ldots, (k-1), i = 1, 2, \ldots, m.$

Since the sum of all the $\delta's$ add to unity, this reduces to:

$$\log[\delta_j(x_i)] = \frac{\exp(\alpha_{0i} + \alpha_{1j}x_{1i} + \alpha_{2j}x_{2i} + \cdots + \alpha_{qj}x_{qi})}{1 + \sum_{j=1}^{k-1}\exp(\alpha_{0i} + \alpha_{1j}x_{1i} + \alpha_{2j}x_{2i} + \cdots + \alpha_{qj}x_{qi})},$$

for $j = 1, 2, \ldots, (k-1)$, the model parameters are estimated by the method of Maximum Likelihood estimation.

6.3 Financial Inclusion Status Data

We used the real data collected from the sample of 395 women entrepreneurs in Nyamasheke District, on financial inclusion status of these women entrepreneurs working with Umurenge SAACO in Nyamasheke District for the use of multinomial logistic regression model. The data set consisted of 395 observations recorded on 12 variables.

7. Modeling the Financial Inclusion Status of Women Entrepreneurs: Rwandan Context

7.1 Specification of the Variables

7.1.1 Dependent Variable

From the questions enclosed in the questionnaire disseminated to the women entrepreneurs to whom the study was conducted to, there was a question that brought their attention in determining whether the Umurenge SACCO has a contribution on financial inclusion and this outcome variables possesses three levels as; access to financial services, usage of financial services and quality of the products and services delivery to them from Umurenge SACCO, and with this regard, the dependent variable possessed three levels "1" for access to financial services, "2" for usage of financial services and "3" quality of the products and services delivery respectively.

7.1.2 Independent Variables

Researchers attempted to select a set of predictor variables related to the financial inclusion that, they believe to have a contribution on financial inclusion. These independent variables are viewed in detail using the questions that were enclosed in the questionnaire disseminated to the respondents to whom the study was study was conducted on. The questions in regard with the aim of the study were prepared in line with the conceptual framework governing the study towards the fulfillment of achievement of the research objectives of the study.

7.2 Baseline Category of the Dependent Variable

Any category of outcome variable can be chosen to be the baseline category, the model will fit equally well data, obtained the same probability and yielding the same estimated values, only the values and interpretation of the parameters will vary (Abdalla, 2012). In this currently research, researchers considered the reference category with smallest frequency so we selected category of (1-access to financial services). With this choice of the reference category, researchers meant the comparison has been against the women entrepreneurs of Nyamasheke District, Rwanda of who suggested that Umurenge SACCOs has a contribution n financial inclusion.

8. Results and Discussions

8.1 Estimation of the Multinomial Logistic Regression Model

We selected eight (8) predictor variables that we believed they had a contribution on financial inclusion of women entrepreneurs in the area under study. Researchers attempted to seek the effect of these predicator variables on the outcome variable by constructing the multinomial logistic regression model and then checked out the results. To accomplish this aim, we used SPSS software version 23, and NOMERG command to estimate the response variable and all the explanatory variables to find the primary model.

8.2 Control of Outcome Variable

From the Table 4.1 below of case processing summary we can exam some points:

Table 4.1: Case Processing Summary by Using 8 Predictor Variables

Outcome Variable Categories	N	Marginal Percentage
1. Access to financial services	90	22.70%
2. Usage of financial services	191	48.50%
3. Quality of the products and service delivery	114	28.80%
Valid	395	100.00%
Missing	0	
Total	395	
Subpopulation	364	

Source: Computed.

The dependent variable has only one value observed in 364 (100.0%) subpopulation. Table 4.1 above is a simple part of the huge table from SPSS that contains all the variables, dependent variable and predictor variables. Since researchers were interested on the outcome variable, from the above table researchers could see that the number of valid observations used in the dependent variable is 395, distributed into three categories. The column of marginal percentages in the table gives the proportion of valid observations obtained in each of the outcome variable' groups,

22.7% of the valid case (Access to financial services as a measure of financial inclusion of women entrepreneurs in the area under study), 48.5% of the valid case had been subjected by (usage of financial services) as a second measure of financial inclusion of women entrepreneurs and 28.8% by (as a third level of measuring the financial inclusion of women entrepreneurs under study) because of Umurenge SACCOs. From the above table researchers then directly computed the chance accuracy of the model as:

$$(0.227)^2 + (0.485)^2 + (0.228)^2 = 0.738738 = 73.8738\%.$$

At this level researchers could compute the proportional by chance accuracy that will be compared to the overall percentage of the final model and this yielded 92.34225% (1.25 x 73.8738%. =92.34225%).

8.3 Examination of Explanatory Variables

To determine which explanatory variables to be included in the final model researchers extracted the information from the output from SPSS in the table of likelihood ratio tests. Table 4.2 below highlights the independent variables that contribute significantly to the model.

Table 4.2: Status of Predictor Variables by Likelihood Ratio Tests

Effect	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	136.433	327.176	40.433[a]	.000	0	.
AgeGroup	134.208	317.004	42.208[b]	1.775	2	.412
Income	133.401	316.196	41.401[b]	.968	2	.616
SocialSecPay	789.117	971.912	697.117	656.683	2	.000
Education	138.367	313.214	50.367[b]	9.933	4	.042
FAccount	143.226	326.021	51.226[b]	10.793	2	.005
LivingPlace	134.185	316.981	42.185[b]	1.752	2	.416
FSaving	151.288	334.083	59.288[b]	18.855	2	.000
Attractiveness	142.622	325.417	50.622[b]	10.189	2	.006
PoliFact	98.579	201.898	46.579[b]	6.146	22	1.000
Typeoccupation	136.389	319.184	44.389[b]	3.955	2	.138
FCredit	159.385	334.233	71.385[b]	30.952	4	.000

From the above table highlighting the contribution of the predictor variables to the dependent variable, it was revealed that the predictor variables such as age group , income, Living place/location of the women entrepreneurs in the area under study, and political factors and type of occupation of women entrepreneurs to whom the study was conducted on; are explanatory variables to be dropped from the final model since they do not contribute meaningfully to the full model and this is due to that fact that, their corresponding p-values to their Chi-Square metrics are greater than the level of significance (cutoff, that is, 5% used in the analysis of the paper**).** In this regard, the above stated five explanatory variables are to be dropped from the final model and the overall fit of the model will not be significantly reduced.

8.4 Model Selection

For the next stage, we refitted the model after excluding the independent variables that did not contribute significantly to the final model given by the test of Likelihood Ratio Tests in table 4.2 above. This procedure has been replicated ten times and stopped when we found parameters estimates are significant.

Table 4.3: Specification of the Selected Model

Description	Model (1)	Model (2)	Model (3)	Model (4)
Number of explanatory variables	7	6	5	4
Valid cases	395	395	395	395
Missing cases	0	0	0	0
Chi-square value (likelihood ratio test)	210.432	209.467	207.261	59.902
Subpopulation	159	189	154	135
Df	11	9	7	4
R-square Cox and Senell	.457	. 452	.450	. 261
R-square Nagelkerke	.643	. 635	.633	. 315
R-square Mc Fadden	.383	.378	.378	.12.6
Classification Overall percentage	79.1%	97.9%	88.3%	89.7%

Source: Computed.

Table 4.3 above revealed that the Model (2) is the best to be appropriate to the data compared to the remaining other models. It has the highest classification overall percentage, includes 5 predictor variables. The details of this selected model can be summarized by its case processing from SPSS output in NOMERG command.

Table 4.4: Case Processing of the Selected Model

Outcome variable categories	N	Marginal Percentage
1. Access to financial services	90	22.70%
2. Usage of financial services	191	48.50%
3. Quality of the products and service delivery	114	28.80%
Valid	395	100.00%
Missing	0	
Total	395	
Subpopulation	189	

Source: Computed.

In addition, by comparing the classification overall percentage of this selected model computed from SPSS, we could notice is greater than the proportional by chance accuracy criterion computed, that is 97.9% > 92.34225% and this supported again the overall fit of the selected model.

8.5 Goodness of Fit and Parameters Estimation

To test whether the null hypothesis is rejected or retained, researchers needed to check if the model without explanatory variables is different from the model with explanatory variables. The table below illustrates that the final model is close to fit the data than the null model.

Table 4.5: Model Fitting Information

Model	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC	BIC	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	798.130	806.078	794.130	781.111	18	.000
Final	53.019	132.495	13.019			

Source: Computed.

The presence of a relationship between the response variable and combination of explanatory variables is based on the statistical significance of the final model chi-square. In our model, the p-value of the model chi-square (781.111) was 0.000, less than the level of significance 0.05.

We rejected the null hypothesis which states that there was no difference between the model without explanatory variables and the model with explanatory variables. The existence of a relationship between the explanatory variables and the response variable was supported.

The AIC (Akaike Information Criterion) and BIC (Bayesian Information Criterion) can be used to check how the fitted values and observed values of the model are close. Using the likelihood ratio test of the selected model, the AIC, BIC and -2log likelihood are close.

Table 4.6: Likelihood Ratio Tests of the Selected Model

Effect	Model Fitting Criteria			Likelihood Ratio Tests		
	AIC of Reduced Model	BIC of Reduced Model	-2 Log Likelihood of Reduced Model	Chi-Square	Df	Sig.
Intercept	53.019	132.495	13.019[a]	.000	0	.
FAccount	49.019	120.548	13.019[b]	.000	2	.000
FSaving	53.358	124.886	17.358[b]	4.338	2	.00
FCredit	83.177	146.758	51.177[b]	38.158	4	.000
Attractiveness	52.903	124.432	16.903[b]	3.884	2	.000
Education	45.640	109.221	13.640	.621	4	.000
SocialSecPay	803.950	867.531	771.950	758.931	4	.000
The Chi-Square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. the null hypothesis is that all parameters of that effect are 0.						
A. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.						
B. Unexpected singularities in the hessian matrix are encountered. This indicates that either some predictor variables should be excluded or some categories should be merged.						

The parameters estimate of each predicator variables gave the information of the expected amount of change in the logit for each one-unit change in the predictor. The table below revealed the logistic coefficients of the selected model that contribute to the logit of the alternative category of the dependent variable.

Table 4.7: Parameter Estimates of the Selected Model

LevelofFInc[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
2.0	Intercept	.410	5690.806	.000	1	1.000			
	[FAccount=.0]	-.754	1579.559	.000	1	1.000	.470	.000	.[b]
	[FAccount=1.0]	0[c]	.	.	0	.	.	.	.
	[FSaving=1.0]	-17.403	2748.467	.000	1	.995	2.767E-008	.000	.[b]
	[FSaving=2.0]	0[c]	.	.	0	.	.	.	.
	[FCredit=1.0]	-19.703	1821.787	.000	1	.991	2.774E-009	.000	.[b]
	[FCredit=2.0]	-36.399	3490.758	.000	1	.992	1.002E-013	.000	.[b]
	[FCredit=3.0]	0[c]	.	.	0	.	.	.	.
	[Attractiveness=.0]	1.017	1.614	.397	1	.529	2.765	.117	65.361
	[Attractiveness=1.0]	0[c]	.	.	0	.	.	.	.
	[Education=1.0]	37.003	5691.370	.000	1	.995	11752388742065080.000	.000	.[b]
	[Education=2.0]	36.286	4863.543	.000	1	.994	5739812435839880.000	.000	.[b]
	[Education=3.0]	0[c]	.	.	0	.	.	.	.
	[SocialSecPay=1.0]	-19.799	2687.419	.000	1	.994	2.521E-009	.000	.[b]
	[SocialSecPay=2.0]	18.500	2414.857	.000	1	.994	108297019.735	.000	.[b]
	[SocialSecPay=3.0]	0[c]	.	.	0	.	.	.	.
3.0	Intercept	19.539	4141.590	.000	1	.996			
	[FAccount=.0]	1.443	1863.705	.000	1	.999	4.234	.000	.[b]
	[FAccount=1.0]	0[c]	.	.	0	.	.	.	.
	[FSaving=1.0]	-15.686	2748.467	.000	1	.995	1.541E-007	.000	.[b]
	[FSaving=2.0]	0[c]	.	.	0	.	.	.	.
	[FCredit=1.0]	-19.298	2691.749	.000	1	.994	4.159E-009	.000	.[b]
	[FCredit=2.0]	-17.428	3774.127	.000	1	.996	2.699E-008	.000	.[b]
	[FCredit=3.0]	0[c]	.	.	0	.	.	.	.
	[Attractiveness=.0]	-1.279	1.524	.704	1	.401	.278	.014	5.516
	[Attractiveness=1.0]	0[c]	.	.	0	.	.	.	.
	[Education=1.0]	34.932	5105.744	.000	1	.995	1481949494106504.000	.000	.[b]
	[Education=2.0]	17.378	.000	.	1	.	35249354.744	35249354.744	35249354.744
	[Education=3.0]	0[c]	.	.	0	.	.	.	.
	[SocialSecPay=1.0]	-39.878	3072.323	.000	1	.990	1.000E-013	.000	.[b]
	[SocialSecPay=2.0]	-19.357	2193.882	.000	1	.993	3.920E-009	.000	.[b]
	[SocialSecPay=3.0]	0[c]	.	.	0	.	.	.	.

a. The reference category is: 1.0.

b. Floating point overflow occurred while computing this statistic. Its value is therefore set to system missing.

c. This parameter is set to zero because it is redundant.

The parameter estimates illustrated in Table 4.7 above revealed the information about the parameter estimate α for each explanatory variable for each alternative category of the outcome variable. The logistic coefficient is the expected quantity of change in the logit for each one unit variation in the predictor and the logit being the predicted one; it is the odds of elements in the category of the dependent variable which has been specified (in this current situation of ours is the first value: 1 that was specified, rather than the alternative value 2 and 3). As we could see in the table illustrating the parameters estimates, the independent variables in the final model that less affect in predicting the logit are Formal saving and Social security payment in regard with the type of occupation-type of job (these variables are coded in SPSS as "FSaving" and "SocialSecPay" respectively.) and this is due to the fact that their logistic coefficient that are closer to zero (cf. Table 4.7 above). Further information can also be recorded from the Wald statistic and the associated p-value to assess whether or not the estimated logistic

coefficients of the independent variables are different from zero. In this current study researchers expected predictor variables which increased the logit to show an exp (α) which is greater than 1.0, those independent variables that which did not have a significant statistical contribution on the logit showed an exp (α) of 1.0 and explanatory variables which decreased the logit have displayed an exp (α) values less than 1.0. Applying these criteria, we found that the explanatory variables that increased the logit of the outcome variable (that is, "Umurenge SACCO has a tangible contribution of financial inclusion of women entrepreneurs in the area under study ") are Education (coded as "Education=1" and "Education=2" for education status of the women entrepreneurs in the area under study) and Formal account (coded as "FAccount") respectively and the explanatory variable that could decrease the logit of the dependent variable were found to be formal credit and attractiveness of the products (coded in SPSS as "FCredit" and "Attractiveness" respectively).

Test whether there is was a significant difference in means of income of women entrepreneurs of Nyamasheke District before and after joining Umurenge SACCOs, the researchers set two hypotheses governing this statement:

H_0: There is no significant difference in means of income of women entrepreneurs of Nyamasheke District before and after joining Umurenge SACCOs, versus

H_1: There is a significant difference in means of income of women entrepreneurs of Nyamasheke District before and after joining Umurenge SACCOs.

To decide on which hypothesis to be rejected or retained among the above two hypotheses, the researchers used the Paired t test as illustrated in the table below

Table 4.8: Paired Samples Statistics

Amount of Money Earned		Mean	N	Std. Deviation	Std. Error Mean
	Income before	34543.712	395	12141.8973	921.6656
	Income after	75456.049	395	32112.5828	741.4068

Source: Computed.

From the above table, the number of women entrepreneurs that worked with Umurenge SACCO towards the improvement of their daily businesses was 395. The average amount of money earned by the women entrepreneurs as their income before being offered the financial services from Umurenge SACCO was found to be 34543.713frw with a corresponding standard deviation of 921.6656. After joining the Umurenge SACCO financial services, their businesses have been improved since the average amount of money earned by these women entrepreneurs in their businesses was found to be 75456.050 with a corresponding standard deviation of 741.4068. To decide on which hypothesis to be rejected or accepted among the two-hypothesis set above, a t-test for one sample (also called paired t-test) was performed in SPSS and the output extracted in has revealed some statistical metrics to be used:

Table 4.9: Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Paired sample	IN.B - IN.A	-40912.337	7.3363	.8202	9.9701	16.7049	15.042	79	.000

Source: Computed/SPSS output.

The statistical test T=15.042 with 394 degrees of freedom with a corresponding p-value =sign. (2-tailed) =.000< 0.05 the cutoff (5%) and deciding to reject the null hypothesis while keeping the alternative hypothesis, which reveals that there is evidence that there is a significant difference in means of income of women entrepreneurs before and after joining the financial services of Umurenge SACCOs. To support this argument of rejecting the null hypothesis and retaining the alternative hypothesis researchers had a look at the computed 95 % confidence interval which is (9.9701, 16.7049). Since this confidence interval does not include zero, it reveals that there is a significance difference in means of earned amount of money (income) before and after joining the financial services of Umurenge SACCOs.

9. Conclusion

In this paper researchers modeled the contribution of Umurenge SACCOs on financial inclusion of women entrepreneurs in Rwanda, cave evidence of Nyamasheke District, using multinomial logistic regression (MLR) model on eleven predicator variables that we thought they had effect on this outcome variable. Based on different statistical metrics associated to multinomial logistic regression model tests in model evaluation and specification of predictor variables, the predictor variables such as age group, income, the living place /location of the respondents, political factors and type of occupation were dropped at the initial stage from other predictor variables since they did not contribute significantly to the outcome variable at all. To move forward, researchers attempted to select the model that fits well the data and that can predict the logit of the outcome variable and noticed that the model that overall fitted the data had only six independent variables that could have a tangible contribution on financial inclusion of women entrepreneurs in the area under study and could be used to predict the logit of this outcome variable and these predictors were "*Education Status/literacy of respondents, formal account, formal saving, formal credit, Social security payment/Type of occupation-type of Job and attractiveness of the financial products delivered by Umurenge SACCOs in the area study*". Test whether there is was a significant difference in means of income of women entrepreneurs of Nyamasheke District before and after joining Umurenge SACCOs in line with the financial inclusion status towards the financial performance of their business, the researchers employed the Paired t test as an inferential statistical method of data analysis

and the statistical metrics obtained revealed that there was a statistical significant difference in means of income of women entrepreneurs before and after joining the financial services of Umurenge SACCOs.

10. Recommendations

Based on the conclusion gathered from the multinomial logistic regress ion model used in this current study to fit the data on modeling the contribution of Umurenge SACCOs on financial inclusion of women entrepreneurs in Rwanda, A case evidence from Nyamasheke District, the following recommendations are addressed to concerned organs of Microfinances and the public in charge of delivering financial services:

1) To strengthen the access of attractive financial products that increase the logit of the financial inclusion as a determinant of this outcome variable
2) To strengthen the delivered financial services, in this regard the increase of different Microfinances in rural area is needed towards the delivery of financial services.
3) Respondents in the area under study are also recommended to strengthen the related policies of formal accounts, formal saving and formal credits.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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