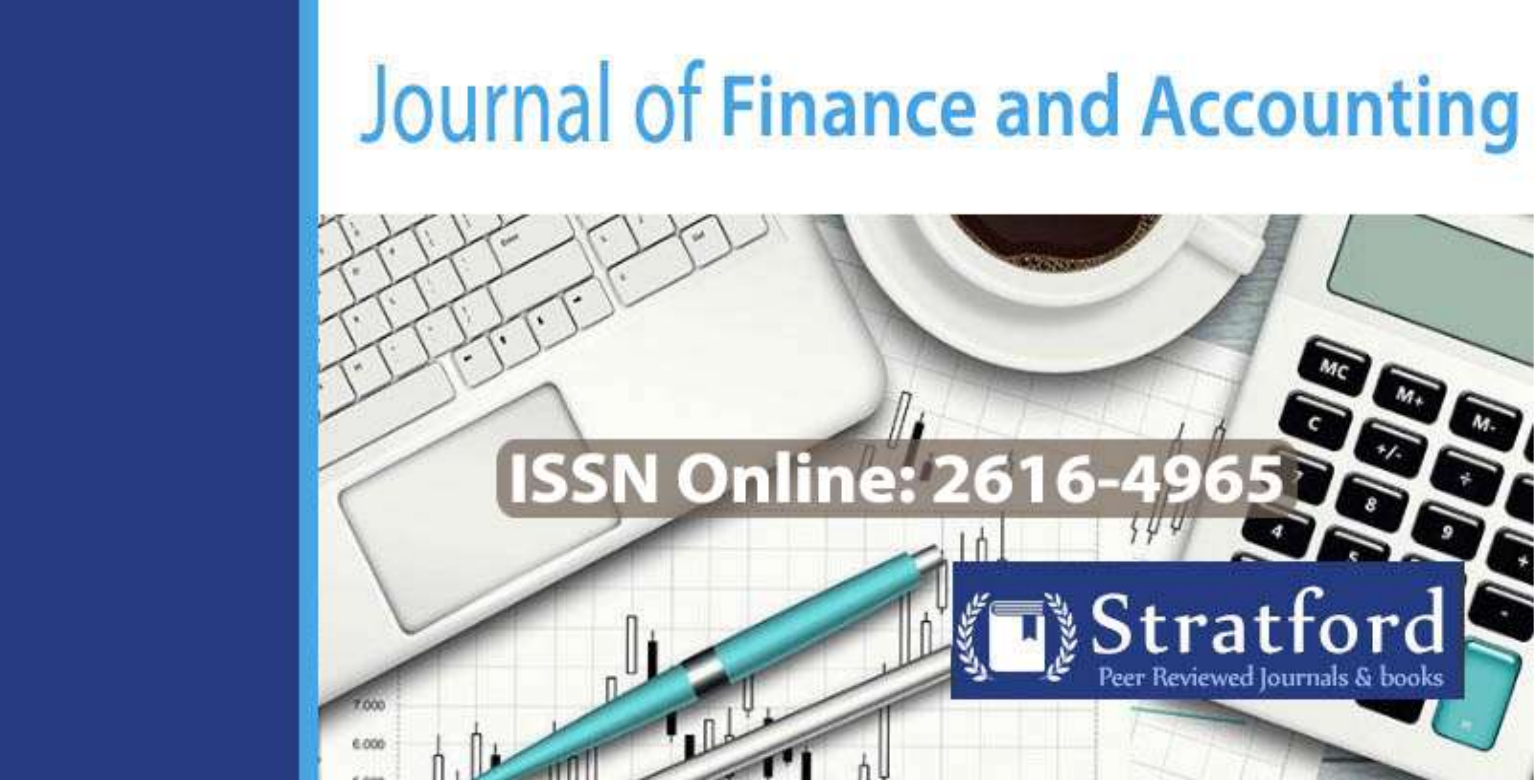

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An Empirical Analysis of Over-Indebtedness Drivers in Microfinance at the Borrower Level in Bukavu, Democratic Republic of Congo

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Abstract

Microfinance institutions have been created to help poor people especially women to be independent and thereby eradicate poverty in developing countries. However, many researchers have revealed meaningful gap between the purpose of microfinance institutions and its practical achievements. Microfinance institution are being accused of impoverishing people through debt. This study, therefore sought to shed light by investigating the drivers of over-indebtedness in microfinance on the borrower level in Bukavu, Democratic Republic of Congo. The study focused on the sociological factors as well as the borrower factors which drive customers into the trap of over-indebtedness. The primary data on these variables was collected through a questionnaire. The data was analyzed using univariate and multivariate analysis including descriptive statistics, correlation analysis, and test of differences between means as well as the logistic regression. Among the sociological influences, the social pressure and the use of loan in nonproductive activities have been found to be positively and significantly associated to over-indebtedness. Among the borrower factors, the study found that the source of credit, the number of loans and the Net-Indebtedness-Index had a positive and significant effect on over-indebtedness while the diversification of activities, the monthly income the number of assets, and the financial literacy had negative and significant association with over-indebtedness. The study found no significant relationship between the loan amount and over-indebtedness. The study recommends to the borrowers to avoid over-borrowing because of social pressure and allocating the loan amount to nonproductive business, to ensure diversification of their activities and to continually reinforce their financial management skills.

Keywords: *Over-Indebtedness, Drivers, Microfinance, Borrower Level, Bukavu, Democratic Republic of Congo*

1.1 Background of the Study

Over the last two decades or more, the microfinance sector has emerged as one of the highest preferred strategy for alleviating poverty in several developing countries (Guerin, 2012). Today, however, the microfinance sector is facing serious criticism and its heyday seems to have come to an end. Not only its impact is being questioned but several empirical studies have suggested that it may do more harm than good. The microfinance sector initially created to tackle poverty is now being accused of exploiting and over-indebting poor customers for profit motives (Alam, 2012). The recent microfinance crisis has revealed tremendous growth of the over-indebtedness phenomenon (Schiks, 2012). With increasing questions about the controversial impact of microfinance on its clients, over-indebtedness seems to be one the most important challenges faced by the microfinance sector. At the same time, over-indebtedness endangers the sustainability of microfinance institutions and their social impact (Guerin, 2012).

Over-indebtedness has become one of the major problems facing the microfinance industry both in developed and developing countries. Customers with over-indebtedness problems suffer for stress and undergo unacceptable sacrifices to repay their loans. In Andhra Pradesh and Karnataka in India, it has been reported that thousands of clients have become trapped in vicious cycles of borrowing from multiple microfinance institutions. This has led to extreme financial vulnerability and sometimes suicide (Guérin, Roesch, Venkatasubramanian, & Kumar, 2011). When clients are unable or struggling to repay debts, they fall under over-indebtedness (Gonzalez, 2008). Many microfinance clients are losing their valuable assets and properties because of over-indebtedness problems (Hossain & Quader, 2018). Consequently, the over-indebtedness phenomenon does not only harm the clients financially, but also deteriorates them physically, psychologically, and socially (Gonzalez, 2008). Over-indebtedness is often a feature of the working poor. It reinforces socioeconomic dependency, jeopardizes the employment situation and decreases growth perspectives for the poor (Haas, 2006). Over-indebtedness is like social exclusion and enhances vulnerability among borrowers. It significantly increases the risk of anxiety, stress, and depression and greatly deteriorates confidence and self-esteem. Over-indebtedness creates high social and welfare cost on microfinance clients (Schiks, 2012).

The lack of a universal definition of over-indebtedness has created difficulties in the understanding and quantification of the concept. Haas (2006) perceives the over-indebtedness of households as the impossibility to repay all debts fully and on time. According to Guérin (2012), over-indebtedness is defined as a process of impoverishment through debt. For sake of our study, we used the definition developed by Schicks (2012) which defines over-indebtedness from a customer protection perspective and considers borrowers over-indebted if they continuously struggle to repay their loans and experience unacceptable sacrifices related to their loans. In Kinshasa, the capital city of DRC, Engel, Behmanesh and Johnston (2014) cited the following factors as drivers of over-indebtedness: On the borrower side, the study highlighted the low financial literacy, deviation of funds, low bargaining power as well as social pressure. On the government side, weak governance and weak institutions, lack of consumer protection, limited economic/financial leeway have been highlighted. On the microfinance institutions level, the study pointed out the level of competition between financial institutions, loan requirements and lending methodologies, the rigidity of loan requirements and debt collection practices. In Bukavu, no study has been found to address the matter.

1.2 Statement of the Problem

Why does over-indebtedness occur? This basic question as to the existence of over-indebtedness matters. This is because, in perfect markets without frictions and uncertainty, over-indebtedness problems should not be observed (Gonzalez, 2008).Report of the Central Bank of Congo of 2018 recorded a total of 15,965 outstanding loans in the selected MFIs in Bukavu at the end of 2018 representing $ 9,970,046.00, with an average portfolio at risk of 19.5% which is far higher than the 5% threshold set by the Central Bank. The over-indebtedness of borrowers is suspected to be one of the causes explaining this high percentage of the portfolio at risk (Engel, Behmanesh & Johnston, 2014).

In most developing countries, it has been noticed a deviation from the primary mission of microfinance. The poverty alleviation claim of MFIs is being questioned (Hossain & Quader, 2018). In this regard, a study by Schicks (2012) in Ghana found out that over-indebtedness seriously harms borrowers before affecting the institution's portfolio. Over-indebted clients incur significant suffering in the repayment of their loans. The study has shown that 18% of micro-borrowers reduce their food while 13% recourse to family support. About 80% of customers who experienced these sacrifices considered them unacceptable. Engel, Behmanesh and Johnston (2014) in Kinshasa revealed that 57% of microfinance customers experience unacceptable sacrifices related to the loan repayment. From the above empirical studies, it is clear that over-indebtedness is an issue that requires much attention. It is, therefore, important to analyze its drivers in Bukavu.

Bukavu is the capital city of South Kivu province located in the eastern of DRC. The city is known for its dense population and reputed to be one of the most entrepreneurial cities in Congo. This explains why the microfinance activities have spread through the city. According to the central Bank's report of 2018, Bukavu is the second microfinance center in Congo with a total of 15 MFIs behind Kinshasa counting 20 MFIs. Although some studies have been carried out on over-indebtedness in the world, very few address the issue of microfinance institutions. So far, it does not appear as if this type of research has been carried out in Bukavu and, therefore, this study fills this gap. The purpose of this research was to examine the drivers of over-indebtedness on the borrower level in Bukavu with a particular focus on the four leading microfinance institutions. It is important to note that microfinance customers was considered over-indebted if they repeatedly struggle to repay their loans, experience unacceptable sacrifices or consider their loans as a heavy burden. At the end of the study, answers to the below- presented questions was provided by testing two hypotheses defined in the literature review.

1.3 Objectives of the Study

i. To determine the sociological influences and/or factors that contribute to the over-indebtedness of microfinance clients in Bukavu.
ii. To determine borrower factors contributing to the over-indebtedness of microfinance clients in Bukavu.

1.4 Research Questions

i. What are the sociological influences and/or factors contributing to the risk/situation of over-indebtedness of microfinance clients in Bukavu?

ii. What are the borrower factors contributing to the risk/situation of over-indebtedness of microfinance clients in Bukavu?

1.5 Conceptual Framework

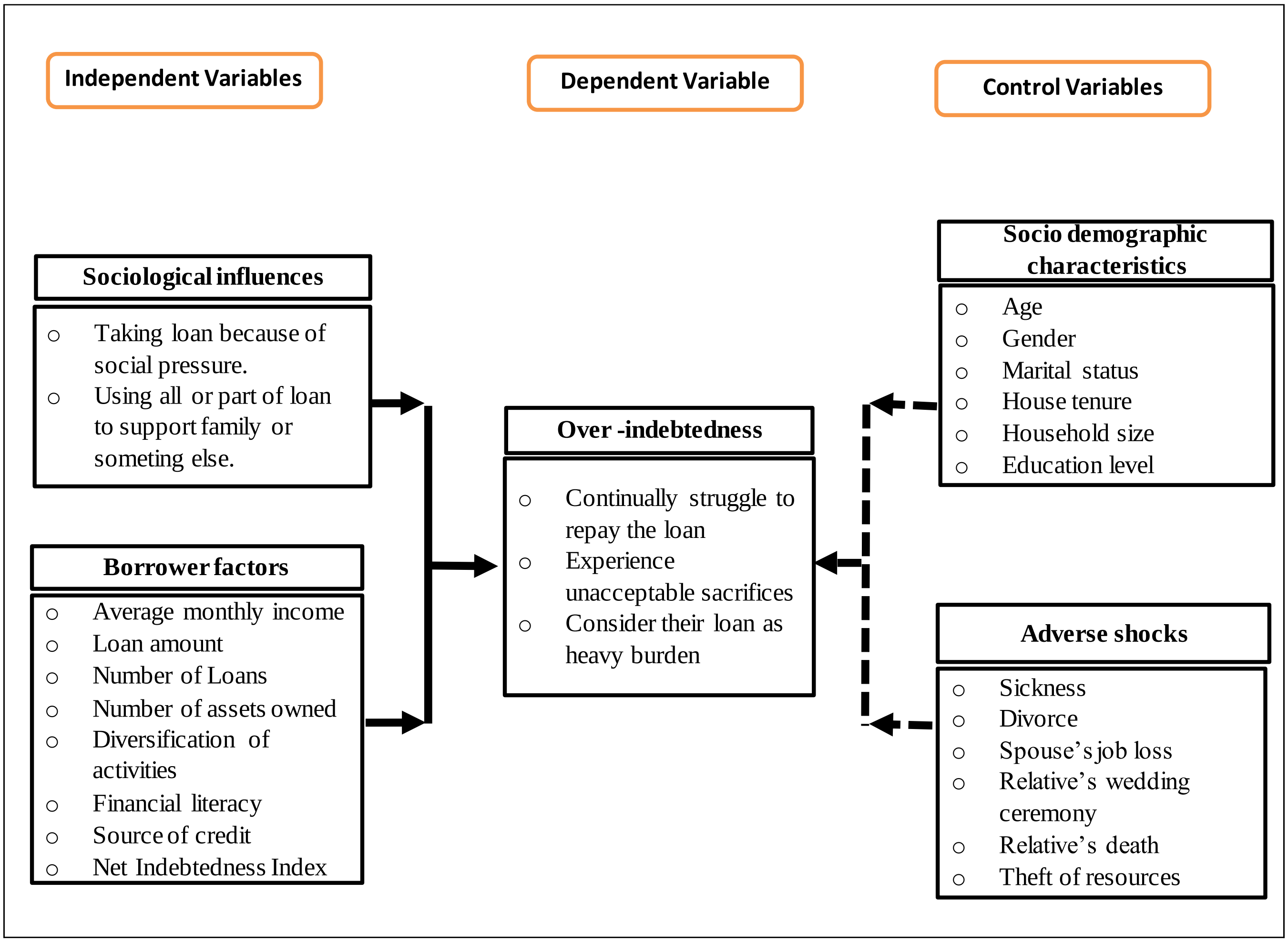

Figure 1: Conceptual Framework

2.0 Literature Review

2.1Theoretical framework

2.1.1 The Life Cycle Theory of Consumption

The life cycle theory of consumption was developed by Modigliani and Brumberg (1954) and further empirically tested by Modigliani and Brumberg (1980). According to this theory, individuals make rational decisions about the amount of money they want to spend at each stage of their lives. They do not make consumption or saving decisions only based only on their current earnings, rather, they also take into account their expected future circumstances and past experience. Furthermore, the life cycle theory of consumption assumes that consumption is constrained by the availability of resources over one's lifetime. This is due to the changes in

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peoples' needs overtime. As the individual grows, the needs vary. People, therefore, tailor their consumption pattern accordingly and this is independent of their income level.

According to the life cycle theory, people have little wealth in their youth. Hence, they often take loans to cover their needs as they expect an increase of their wealth in the future. In the middle age, people are more active and able to pay loans contracted in the youth and save for their retirement. The peak wealth is attained just before their retirement. At their old age, people try to maintain as much as possible their previous life standard. They survive on early savings and sale of accumulated assets during the youth and the middle age (Deaton, 2005). In connection to the above, over-indebtedness occurs when individuals have borrowed too much in their beginnings and at the middle stage of their lives to smooth their consumption patterns. The life cycle theory of consumption, therefore, greatly applied to determine the causes of non-repayment and which category of individuals is more likely to fall under arrears.

Furthermore, the life cycle theory assumes that households or individuals with high incomes are more able to save in their lifetime and possess greater financial savvy than households or individuals with low incomes. The life cycle theory suggests the household or individual with lower income should borrow less than those with higher income because it reduces significantly the risk of defaults and permits to keep the consumption level during unproductive periods of life (Yilmazer & DeVaney, 2005).

When evaluating the over-indebtedness of microfinance customers, the severity of the repayment problems represents a key element in the definition of over-indebtedness. The majority of empirical researches tends to consider borrowers over-indebted if their debts problems seem persistent and structural over a certain period of time. In relation to this, the life cycle theory of consumption aims to stabilize and smooth consumption levels over the time horizon, hence, a high debt level at a young age is rational and justified only if the income level is expected to grow. In this situation, the permanent borrower's income over time would be a reliable reference in measuring over-indebtedness (Schiks, 2012).

Conversely, given the short term need of cash of the microfinance borrowers in developing countries and the uncertainty level surrounding their activities, microfinance customers prefer to focus more on the short term rather than the long-term horizon. This reveals a bit the limits of the life cycle hypothesis in explaining the over-indebtedness in general and more specifically in the context of developing countries.

2.1.2 Permanent Income Hypothesis (PIH)

Developed by Milton Fridman (1957), the permanent income hypothesis is a theory that links an individual's consumption at any point in time to that individual's total income earned over their lifetime. This theory is closely related the life-cycle hypothesis as presented by Modigliani and Brumberg (1954).According to the theory, an individual's consumption pattern depend on his permanent income. The theory supposes an individual consumption at a point in time is defined not only by present incomes but also the expected future revenues. Fridman (1957) defines, therefore, income as the amount that an individual can consume while wealth remains unchanged.

According to Fridman (1957), a household's actual income in a particular period is composed of 2 components: the permanent component (Yp) representing the permanent income and (Y_t) the transitory component representing the transitory income. The consumer's income is, therefore, presented as follows: Y= YP + Yt. Fridman (1957) proposed to interpret of the permanent income component as reflecting the effect of those factors that the unit regards as determining its capital value or wealth. The permanent component of the income can hence, be understood as the "expected" income. For instance the nonhuman wealth; the personal attributes of an individual, such as their training, ability, assets, personality and so on. The transitory component represent all other factors considered by the earner as accidental. Similarly, an individual's expenditures at a point in time is regarded as the sum of 2 components including a permanent (Cp) and a transitory component (Ct). And represented as follows: C= CP + Ct

Fridman (1957) demonstrated that the permanent consumption of an individual is the part of consumption determined by the permanent income, whereas, the transitory consumption can be interpreted as the unanticipated part of consumption. The factors producing transitory components of consumption differ from an individual to another. For instance unanticipated sickness for some and a favorable opportunity to purchase for others. It should be noted that transitory income and transitory consumption are considered temporary. Empirical studies demonstrated that if a household's transitory income is positive (Yt>Yp), the actual income exceeds its permanent income. The household will, therefore, increase its saving during that period. On the other hand, if it's transitory income is negative (Yt<Yp), the actual income will be less than the permanent income. In this situation, the household will be tempted to reduce its savings. In connection to the above, Carroll (1997) provided evidence that when consumers experience scarcity of resource, their marginal utility decreases.

Moreover, the permanent income hypothesis assume that the transitory consumption is random with respect to transitory income. This assumption implies that the marginal propensity to consume (MPC) from transitory income is zero. This means that when a household receive a positive transitory income, it will not affect its consumption pattern. This is because the consumption pattern of the household is not based on the transitory income, rather, on the permanent income. The additional transitory income will be saved by the household (Kambel & Mankiw, 1990). In a similar way, if the household receives a negative transitory income, the consumption pattern will not be affected rather, the negative transitory income will result on the household's savings reduction. However, if a household receives a windfall, the consumption pattern will tend change positively. Fridman and other proponents justified this by arguing that the purchase of asset should not be considered as consumption, rather, it should be regarded as investment. The assumption of zero marginal propensity to consume is more plausible if only the services provided by the purchased asset is counted.

The fact that the theory stipulates that the consumption is highly dependent of the permanent income of an individual, its variation may thus affect positively or negatively the financial capacity. The negative variation of the permanent income result on decrease of savings and indebtedness which lead leads to over-indebtedness in case of persistence. The researcher, therefore believes the applicability of this theory in this study will affirm the negative relationship between the level of income and over-indebtedness.

2.2 Empirical Review

2.2.1 Definition of Over-Indebtedness

Despite the topicality of the subject, there is a lack of consensus on what over-indebtedness is and how it should be measured (Disney, Bridges, & Gathergood, 2008). Over-indebtedness is a commonly used concept, however, it covers relatively different realities depending on the countries, authors, and trends. In the view of Guérin, Morvant-roux and Villareal (2013), over-indebtedness in microfinance can be looked at as a process of impoverishment through debt. Furthermore, such impoverishment can differ from one customer to another, from asset loss to feelings of downward social mobility, humiliation, shame. These, therefore, open the room for different manifestations and perceptions of over-indebtedness among customers. According to Toussaint (2000), there is over-indebtedness if the share of income devoted to repaying debts is higher than 33%. This definition turns out to be more incomplete since it does not take into account other incomes and the particular social characteristics of households which it considers to be over-indebted. In the view of Gloukoviezoff (2006), over-indebted are all people aged 18 and over, who live in a household whose "head of household" has admitted having difficulties in paying off his debts. It is important to note that this is an extremely broad definition of over-indebtedness as the difficulties in servicing debt does not mean directly over-indebtedness.

The Bank of France (2014) in its annual report highlights two types of over-indebtedness, active over-indebtedness and passive over-indebtedness. The first type of over-indebtedness relates to an excess of indebtedness without modification of resources, which is a consequence of taking loans in several institutions at the same time. It is mainly against this type of over-indebtedness that institutions must fight by exchanging information on customers because implicitly, the responsibility for this type of over-indebtedness lies with the over-indebted. The second type, passive over-indebtedness, is the result of an unforeseen change in the level of resources and / or expenses following a "life accident" e.g. unemployment, divorce, illness, death, etc. According to Duhaime (2003), an individual is considered over-indebted when, with well-meaning intentions, he/she is unable to meet the obligations coming from debts obtained for non-professional reasons. Despite the quality of this definition, the precise knowledge of over-indebtedness and the number of people or households affected by this phenomenon, the factors leading to it are still not clearly defined.

In the opinion of Rebière (2009), an individual is over-indebted as soon as he alone and/or one of the members of the budgetary solidarity to which he belongs is liable for debts and repayment capacity of the budgetary solidarity, i.e. the remaining income after deduction of the comprehensive expenses ensuring a decent standard of living for budgetary solidarity becomes structurally lower than the expenditure to be made to repay debts when they fall due. This author shows a particular interest in budgetary solidarity, it means all the members constituting a household. The definition focus on dividing the responsibility for over-indebtedness not to a single person but rather to all members because it reduces the burden of repayment of each member.

In the opinion of Gonzalez (2008), over-indebtedness occurs when payment difficulties emerge. Over-indebtedness may result from the unwillingness to repay, inability to meet all or part of the financial commitment, or unacceptable sacrifices for the repayment of the debt. In contrast, when the borrower is willing to repay and the repayment does not incur unacceptable sacrifices, it implies the absence of over-indebtedness. This is a very important definition as it is among the first to reveal an approach to the sacrifice-based understanding of over-indebtedness. However, it doesn’t define which kind of sacrifice should be considered in the classification of the over-indebtedness phenomenon.

According to the European Commission (2010), a household is considered over-indebted when it’s present and expected resources are not enough to meet its financial obligations without diminishing its living standard below the minimum acceptable in the concerned country. This definition of over-indebtedness might be widely accepted theoretically, however, practically it is very difficult to identify households in such a situation. As a result, empirical studies have tended to use more practical definitions that encompass all aspects of over-indebtedness. The study by Simonie (2012) is the first to establish the link between over-indebtedness and mental health. The study defined over-indebtedness as a situation in which an individual is no longer able, in a sustainable manner, to pay his debts due or to fall due from his current income.

This author brought out a very important nuance between two concepts notably over-indebtedness and the problematic debt situation; she showed that the latter is characterized by a financial incapacity, lasting or not, of individuals to settle one or more debts that have come due. Over-indebtedness is, therefore, a structural phenomenon due to its lasting nature, which is not necessarily the case for problematic debt situations. A more precise definition, cited by Haas (2006) and derived from the German Federal Ministry defines over-indebtedness as follows: "A household is regarded to be over-indebted when its resources, despite reducing of the living standard, are not enough to meet all financial commitments for a long period time." The importance of this definition is that it relates the longer period minimum spending pattern of the household to its available resources, where the resources are deficient, the household is considered to be over-indebted. This approach has, in my view, a clear structural basis.

2.2.2 Drivers of Over-Indebtedness

The study by Drees (2003) has demonstrated that the over-indebtedness of French borrowers is mainly caused by several factors including the use of loan for consumption needs, the lower-income level, and the accumulation of loans with higher in comparison to their low incomes. The research excluded the level of education for it was not significant.Analyzing the drivers of over-indebtedness in United Kingdome, Disney, Bridges and Gathergood (2008) found that the drivers of over-indebtedness are classified into three categories: firstly, the financial imprudence, secondly the adverse shocks to income and thirdly the macroeconomic factors. Among factors explaining the financial imprudence, the authors have discovered that UK borrowers lack financial literacy, over-borrow for consumption needs and lack of insurance. Concerning the adverse shocks to income, three principal sources of income shocks were identified: unemployment, divorce and ill health. About the macroeconomic factors, movements in interest rates and the restrictions on credit or the credit crunch seemed to explain more the over-indebtedness of customers in the UK.

The study by Spannuth and Pytkowska (2012) concluded that multiple borrowing, higher loan amounts, and larger monthly repayments, borrowing for personal needs, lack of savings, lower-income and borrowing from informal sources drove customers to over-indebtedness on the borrower side. On the lender side, credit information sharing system, growing competition, and market conduct as well as lending procedures have been found correlating with the over-indebtedness perception among microfinance customers in Azerbaijan.

The study by Liv (2013) in Cambodia found that 22% of borrowers were over-indebted considering the objective definition, against 6% based on the subjective definition. According to the study, the drivers of OID include multiple borrowing, nonproductive loan use, insufficient income and financial literacy. The overall education had a negative relationship with insolvency

The study conducted by Guerin *et al.* (2011) in rural India found that study borrowers incur unacceptable sacrifices in relation to their loans. The sacrifices include the lack of food, school dropout and high stress among others. The major factors explaining the over-indebtedness of households and individual in rural India include the lower income level and their instabilities, the financial literacy, the adverse shocks to incomes. In Bolivia, Gonzalez (2008) discovered that over-indebtedness is the result of opportunistic behavior of both borrowers and lenders, systematic external shocks like partner death, divorce, and sickness. In addition to that, the study found that the inability of microfinance institutions to estimate the real repayment capacity of the lender.

A study by Schicks (2012) in Ghana asserts that the Net Indebtedness index, unproductive loan use, social pressure, financial literacy are positively correlated to over-indebtedness, however, the study found no significant correlation with the factors like total debt amounts or multiple borrowing. Analyzing the 19 early warning indicators of over-indebtedness in Kinshasa, Engel, Behmanesh and Johnston (2014) revealed that the risk for Kinshasa is relatively high at 6.04 out of 10. Amongst the drivers, the following were cited: on the borrower level, the study highlighted the low financial literacy, misuse or deviation of funds as well as social pressure have. On the government side, weak governance and weak institutions, lack of consumer protection, limited economic/financial leeway have been highlighted. On the microfinance institutions side, the study pointed out the level of competition between financial institutions, loan requirements and lending methodologies, the rigidity of loan requirements and debt collection practices.

2.2.3 Measures of Over-Indebtedness

The measures of over-indebtedness are drawn from the study by Spannuth and Pytkowska (2012) which proposes a two-staged measurement procedure: (i) an objective measure of the amount of debt service with the net income called net indebtedness index and (ii) a subjective measure of the perception of the debt burden.

Objective measures of over-indebtedness

The study by Spannuth and Pytkowska (2012) calculated the net indebtedness index using the following formula:

$$\textbf{Net Indebtedness Index} = \frac{\text{Total monthly installments}}{\text{Net monthly household income}}$$

Based on the calculation of the net indebtedness index, microfinance customers are classified into four groups as follows:

Table 1: Distribution of Microfinance Borrower by Net Indebtedness Index

Status	Description
Insolvent	If the household spends 100%of the net monthly income or more on loan repayment.
Critical	If the household spends between 75% and 100% of the net monthly income on loan repayment.
At risk of over-indebtedness	If the household spends between 50% and 75% of the net monthly income on loan repayment.
Not over-indebted	If the household spends less than 50% of the monthly income on loan repayment.

Source: (Spannuth&Pytkowska2012)

Subjective measures of over-indebtedness

The study by Spannuth and Pytkowska (2012) proposed to assess the perception of debt burden by asking clients to what extent debt repayment had been a burden on their household finances. The subjective measure emphasizes more on highlighting different sacrifices experienced by clients in relation to the loan. This measure has been applied in prior studies including Schicks (2012) in Ghana.

3.0 Research Methodology

The study adopted a quantitative research design. The study sought to determine the drivers of over-indebtedness at the borrower level in Bukavu. The researcher collected primary data directly on the field for a depth understanding of the over-indebtedness phenomenon. The population of interest in this study was composed of the 15,965 microfinance borrowers of the four leading microfinance institutions in Bukavu which are MECREBU, COOPEC NYAWERA, COOPEC CAHI and FINCA. According to the Central Bank of Congo's report of 2018, these institutions hold more than 50% of microfinance customers in Bukavu. This explains why they were chosen for this study. For this study, the researcher adopted a stratified sampling technique in which borrowers of every stratum were randomly selected in identifying the respondents. This technique was considered appropriate as the number of loans recorded in each of the four selected microfinance institutions would be obtained from the Central Bank report of 2018.The sample size for the study was made up of 384 microfinance borrowers. The data was collected through a questionnaire. The respondents were directly met at their meeting places during their weekly reunions. The surveys took place over a period covering two weeks starting from October 5, 2020 to October 15, 2020 in the region of Bukavu in DRC.

The survey was carried out by 5 investigators, who are former students at the Catholic University of Bukavu with relevant experience in data collection especially with local NGOs. The descriptive were used for a better understanding of the data. For this study, bar charts and histograms were used to present the basic features of the data. In addition to that, some measures of central tendency were also used. They involve the calculation of means, median and modes as it seems necessary to describe the data. The study used the person's correlation to examine the preliminary association between the sociological influences, borrower factors and over-indebtedness. The test of difference between the means of over-indebted and not over-indebted groups of microfinance borrowers are different was used to assess whether there was any significant differences. The study used the logistic regression model to examine the relationship between sociological influences and borrower factors with over-indebtedness. The researcher tested the hypothesis by estimating the below model:

$$\begin{aligned} OID_i = \alpha_0 &+ \beta_1 LSP_i + \beta_2 LFN_i + \beta_3 AMI_i + \beta_4 LA_i + \beta_5 NL_i + \beta_6 NOA_i + \beta_7 DOA_i \\ &+ \beta_8 FLIT_i + \beta_9 SOC_i + \beta_{10} NII_i + \beta_{11} AGE_i + \beta_{12} GDR_i + \beta_{13} MST_i \\ &+ \beta_{14} HTN_i + \beta_{15} HHS_i + \beta_{16} EDL_i + \beta_{17} SICK_i + \beta_{18} DIV_i + \beta_{19} SJL_i \\ &+ \beta_{20} RWED_i + \beta_{21} RDEATH_i + \beta_{22} TOR_i + U_i \end{aligned}$$

Where OIDi is the binary measure of over-indebtedness for each respondent i, based on the sacrifice-based definition as constructed earlier. According to this definition, microfinance borrowers were considered over-indebted if they regularly struggle to repay their loans, experience unacceptable sacrifices and consider their loan as heavy burden. LPSi is the social

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pressure; LFNi is the use of all or part of the loan for family needs; AMIi is the average monthly income of the borrower; LAiis loan amount at the disbursement; NLi is the total number of loans owned by the borrower; NOAi is the number of assets owned by the borrower; DOAi is the diversification of activities; FLITi is the financial literacy; SOCi is the source of loan; NIIi is the net indebtedness index; AGEi is the age; GDRi is the Gender; MSTiis the marital status; HTNi is the house tenure; HHSi is household size; EDLi is the education level; SICKi is the sickness; DIVi is the divorce or separation with the spouse, RWEDiis relative's wedding i.e. if the borrowers contributed to a relative's wedding ceremony during the course of the debt, RDEATHiis the relative's death i.e. if the borrower lost a close relative during the course of the debt, TORiis the theft of resources i.e. if the borrowers reported a loss of financial or material resources due to theftand Ui the error term.

4.0 Findings and Discussion

4.1 Descriptive Statistics

Table 2: Descriptive Statistics (N=384)

Variables	Minimum	Maximum	Mean	Std. Deviation
Age	20.00	74.00	39.53	10.29
Borrower's dependents	0.00	16.00	5.77	3.29
Loan amount (in USD)	50.00	16,500.00	837.14	1,750.14
Monthly repayment (in USD)	10.00	3,000.00	148.54	287.77
average monthly income (in USD)	30.00	7,000.00	626.68	900.75
Number of loans	1.00	4.00	1.90	0.55
Net Indebtedness Index	0.02	4.50	0.29	0.37
Asset of number	0.00	5.00	0.76	0.99

Source: Research Data

The results in the above Table 2 show that the oldest person in the sample was 74 while the youngest was 20 with an average of 39.53 and a standard deviation of 10.29. According to the results, the average number of dependents is 6 with a minimum of 0 and a maximum of 16 and a standard deviation of 3.29.The study found that the average loan amount is $ 837.14 with a minimum of $50 and a maximum of 16500. It should be noted that the standard deviation of loan amount is $1750.14. About the monthly repayment, the study found an average repayment amount of $148.54 with a minimum of $10 and a maximum $3000 while the standard deviation of the monthly repayment amount stood at $287.77.Further, the study established that the average monthly income was $ 626.68 with a minimum of $30 and a maximum $ 7000 respectively and a standard deviation of $ 900.75.

In regard to the net indebtedness index, the found out that the minimum net indebtedness index in the sample was 0.02 and the maximum is 4.5 with a mean of 0.29. Which means that in the sample, the average part of the income allocated to the loan repayment is 29%. However, some people in the sample allocated more than 100% of their income to the loan repayment. The standard deviation of the net indebtedness index is 0.37. Again the study found out that the average number of loans were 2 with a minimum of 1 and a maximum of 4 loans with a standard deviation of 0.55.According to the descriptive statistics results, the average number of assets per individual is 1 with a minimum of 0 and a maximum of 5. The asset number's standard deviation is 1.257.

4.2. Categorization of over-indebtedness

Distribution of borrowers based on the subjective definition of OID

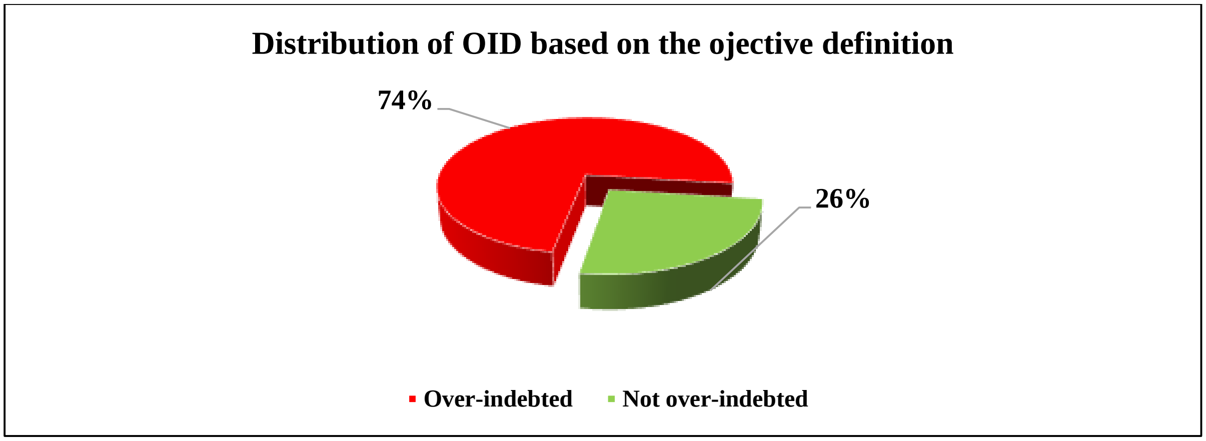

Figure 2: Distribution of OID based on subjective definition

The results in Figure 2 show that 74% of the respondents regularly struggle to repay their loan, consider the sacrifice incurred unacceptable and consider their loan as a heavy burden. They are hence, categorized as over-indebted. The results also show that 26% of the respondents don't struggle regularly or consider their sacrifices acceptable or don't consider their loan as a heavy burden. There are not, therefore, categorized as over-indebted.

4.3 Correlation Analysis

The results of the correlation analysis indicated that the variables house tenure, social pressure, use of all or part of loan for nonproductive activities, source of credit, number of loans, monthly income, diversification of activities, number of assets, spouse job loss as well as theft of resources have a significant relationship with over-indebtedness. As far as the dependents variables are concerned, the variable social pressure is positively and significantly correlated to over-indebtedness (r=0.526, P-value= 0.000) at 1% level. The Pearson correlation results also show that the variable use of the total or part of loan in nonproductive activities is positively and significantly correlated with over-indebtedness (r=0.429, P-value= 0.009) at 1% level. In a similar way, the results portray a positive and significant relationship between the variable sources of credit and over-indebtedness (r=0.521, P-value= 0.004) at 1% level. Again, the Pearson correlation' results revealed that the variable number of loans is positively and significantly correlated with over-indebtedness at 1% level (r=0.393, P-value=0.393). Also the variable monthly income is negatively and significantly correlated with over-indebtedness(r=-0.124, P-value= -0.015) at 5% level.

The results also indicate that the variable diversification of activities is negatively and significantly correlated to over-indebtedness (r= -0.292, P-value= 0.003) at 1% level. Similarly, the variable number of assets is negatively and significantly correlated to over-indebtedness (r= -0214, P-value= 0.04) at 1% level. About the control variable, it should be noted that the variables house tenure, sickness, spouse job loss as well as the theft of resources are significantly correlated to over-indebtedness. While the variable house tenure is positively and significantly correlated with over-indebtedness at 1% level (r= 0.330, P-value=0.001), the variable sickness is positive

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and significant correlated to over-indebtedness at 5% level (r=0,121, P-value= 0.018), the variable spouse job loss is also positively and significantly correlated to over indebtedness at 1% level (r=-0.184, P-value= 0.000). The variable theft of resources is positively and significantly correlated with over-indebtedness. In summary, it is paramount to note that eleven variable are significantly correlated to over-indebtedness. Four are control variables while seven are independent variables. Amongst the control variable four of them are positively and significantly correlated to OID, they include house tenure, sickness, spouse job loss and theft of resources. Among the independent variables, social pressure, the use of loan, the source of credit, as well as the number of loans are positively and significantly correlated to over-indebtedness correlated to OID, while the diversification of activities, the monthly income and the assets number are negatively and significantly correlated to OID.

4.4 Multivariate Analysis – Logistic Regression

Table 3: Logistic regression

variables	Coefficient	P-Value	Odds ratio	95.0% Confidence Intervals for Odds ratios	
				Lower	Upper
GENDER	0.328	0.535	1.388	0.492	3.919
AGE	0.182	**0.019****	1.199	1.031	1.395
MARITAL_STATUS	-0.22	0.353	0.802	0.504	1.277
EDUC_LEVEL		0.201			
Primary level	-1.525	**0.081****	1.218	1.000	1.308
Secondary level	-0.74	0.382	0.477	0.091	2.506
University level	-1.69	0.157	0.185	0.018	1.92
DEPENDENTS	0.059	0.442	1.06	0.913	1.231
HOUSE_TENURE	1.155	**0.018****	3.175	1.22	8.266
SOURCE_OF CREDIT	2.514	**0.015****	12.36	1.633	93.555
NUMBER_OF_LOANS	0.952	0.267	2.59	0.483	13.891
LOAN_USE	2.347	**0.000*****	10.45	4.36	25.045
SOCIAL_PRESSURE	1.229	**0.000*****	3.419	2.213	5.281
DIV_OF_ACT	-2.583	**0.044****	1.076	0.006	1.929
MONTHLY_INCOME	0.00	0.525	1.000	0.999	1.000
TOT_LOANS_AMOUNT	0.00	0.422	1.000	1.000	1.000
NET_INDEBTEDNESS_INDEX	1.25	**0.006*****	1.286	0.118	1.694
ASSET_NUMBER	-0.947	**0.001*****	2.388	0.224	3.673
FIN_LITERACY	-0.389	**0.074****	1.476	0.963	2.263
SICKNESS	0.574	0.234	1.776	0.69	4.57
SEP_DIVORCE	-1.103	0.25	0.332	0.051	2.176
SPOUSE_JOB_LOSS	0.96	**0.05****	2.611	1.000	6.821
RELATIVES_WEDD	0.862	0.377	2.367	0.35	16.028
RELATIVES_DEATH	-0.854	0.104	0.426	0.152	1.193
THEFT	1.441	**0.003*****	4.223	1.623	10.989
Constant	-10.776	0.000	0.000		

***, **, and * represents significance at 1%, 5% and 10% ; GENDER is the borrower's gender; AGE is the borrower's age; EDU_LEVEL is the borrower's level of education; MARITAL_STATUS is the borrower's marital status; DEPENDENTS is the number of people in the borrower's household; HOUSE_TENURE is the borrower's housing situation, NUMBER_OF_LOANS is the total number of loans to be repaid by the borrower; LOAN_AMOUNT is the total amount of loan to be repaid; LOAN_USE is the loan's spending pattern; DIV_OF_ACTIVITIES is the diversification of activities; MONTHLY_INCOME is the average monthly income , NET_INDEBTEDNESS_INDEX is the monthly installment divided by the monthly income; FIN_LITERACY is the borrower's financial literacy, ASSET_NUMBER is the total number of assets owned by the borrower, OID is the dependent dummy variable of over-indebtedness, SICKNESS is the change in borrower's health situation during the repayment period, SEP_DIVORCE is change in borrower's marital status during the repayment period; SPOUSE_JOB_LOSS is the change in the borrower's spouse job situation, RELATIVES_WEDD is the borrower's participation in the relative's wedding; THEFT is the loss of resources due to theft.

The results in the Table 3 above show that among the independent variables, the source of credit, the use of loan in nonproductive activities, the social pressure, the diversification of activities, the net indebtedness index, the number of assets, and the financial literacy are significantly related to over-indebtedness. Among the control variables, age, house tenure, education level, spouse job loss, and theft of resources are significantly related to over-indebtedness.

Regarding the independent variables, the study found a significantly positive relationship between the source of credit and over-indebtedness at 5% level (β=2.514, P-Value = 0.015, Odds ratio=12.36). The odd ratio of 12.36 means that having a loan from informal sources increase the risk of over-indebtedness by 12.36. The study also found that the use of the loan amount in nonproductive activities is positively and significantly related to over-indebtedness at 1% level (β=2.347, P-Value = 0.00, Odds ratio=10.45). The respondents who used the loan in nonproductive activities are 10.45 times more likely to fall into over-indebtedness. Similarly, the study reveal a positive and significant relationship between the social pressure and over-indebtedness at 1% level (β=1.229, P-Value=0.00, Odds ratio=3.418). According to this results, taking much loan because of social pressure increase the risk of over-indebtedness by 3.418.

Unlike the social pressure and the use of loan, the study revealed a negative and significant relationship between the diversification of activities and over-indebtedness at 5% level (β=-2.583, P-Value = 0.044, Odds ratio=1.076). According to the above results, having an addition income generating activity reduce the risk of over-indebtedness by 1.076. The study also found a positive and significant relationship between the Net-Indebtedness-Index and over-indebtedness at 1% level (β=1.25, P-Value = 0.006, Odds ratio=1.286). Therefore, this implies that each additional dollar allocated to loan repayment increase the risk of over-indebtedness by 1.286.

The results of the logistic regression revealed a negative and significant relationship between over-indebtedness and the number of assets owned by the borrower at 1% level (β=-0.947, P-Value = 0.00, Odds ratio=2.388). Hence, this implies that each additional asset owned by the borrower reduces the risk of over-indebtedness by 2.388. About the financial literacy, the study found a negative and significant relationship with over-indebtedness at 10% level (β=-0.389, P-Value = 0.074, Odds ratio=1.476). These results, therefore, imply that borrowers with low financial literacy are 1.476 time more likely to fall into over-indebtedness. Concerning the control variables the age is significantly and positively correlated with over-indebtedness at 5% level (β=0.182, P-Value = 0.019, Odds ratio=1.199). This implies, therefore, that when the age increase by one the risk of over-indebtedness increases by 1.199. These results are consistent with Disney and al. (2008) in the UK who explained this situation by the fact that the increase in borrower's age is associated with the increase in social responsibilities which involve more often financial implications.

About the education level, the study found a negative and significant relationship education level and over-indebtedness at 10% level (β=-1.525, P-Value = 0.081, Odds ratio=1.218). This implies that compared to borrowers who have not attended any school, those with primary level are 1.218 times less likely to fall into over-indebtedness. In addition to the above, the study found a positive and significant relationship between the spouse job loss and over-indebtedness at 10% level (β=0.96, P-Value = 0.05, Odds ratio=2.611). These results imply that borrowers whose spouses have lost their jobs are 2.661 times more likely to fall into over-indebtedness. This situation seems to have been aggravated by the recent spread of the recent Covid-19 pandemic. Also, the study found a positive and significant relationship between the theft of resources and over-indebtedness at 1% level (β=1.441, P-Value = 0.003, Odds ratio=4.233). This implies that borrowers who have experienced loss of resources due to theft are 4.233 more likely to fall under over-indebtedness. The above results, therefore, support the research hypothesis that the sociological factors as well as borrower factors are the main drivers of over-indebtedness on the borrower level in Bukavu.

5.0 Conclusions

The study concludes that the sociological factors including social pressure, and the use of loan for nonproductive activities had a positive and significant relationship with over-indebtedness. These findings, therefore, support the first hypothesis of the study. This means that borrowers who have experienced sociological influences including social pressure or use of the loan amount for nonproductive activities had a higher risk of being over-indebted. Borrower factors are, therefore, important drivers of over-indebtedness. These results support the second hypothesis of the study. Indeed, the source of credit is positively and significantly associated with over-indebtedness. This means that having an informal loan in the portfolio increases significantly the risk over-indebtedness.

Diversification of activities and the number of assets are negatively and significantly associated to over-indebtedness. This means that having an additional income generating activity provide the borrower with additional income and hence, reduce the risk of falling into the trap of over-indebtedness. The negative and significant association between the number of assets and over-indebtedness imply that the assets owned by the borrower can be sold and help in repaying loans and subsequently reduce the risk of being over-indebted. The study concludes that the net-indebtedness-index is positively associated with over-indebtedness. This means that the higher the net-indebtedness-index, the higher the risk of over-indebtedness. Financial literacy is negatively and significantly associated with over-indebtedness. This means that the lower the financial literacy the higher the risk of over-indebted.

The monthly income is negatively and significantly associated with over-indebtedness. This means that borrowers with lower incomes are more likely to be over-indebted. In addition to that, the study concludes that the number of loans is positively and significantly associated to over-indebtedness. This means that an increase in the number of loans leads to an increase in the monthly installments and hence, an increase in the risk of over-indebtedness. Also the study concludes that no significant association have been found between the loan amount and over-indebtedness. In summary, the use of loan in nonproductive activities, social pressure, the source of credit, diversification of activities, the number of assets, the net indebtedness index, financial literacy, monthly income have been found to be borrower level drivers of over-indebtedness. However, no significant association have been found between the loan amount and over-indebtedness. The hypotheses of the study have, therefore, been supported by the findings of the study.

6.0 Recommendations

To the borrowers, the study recommends to allocate the loan amount according to the reasons for its request and not using the loan amount for other needs; to reinforce the financial management skills and hence reduce their sacrifices and improve their repayment performance; to diversify their activities as much as possible to enable them to repay the loan during periods of low income in the main activities; to avoid loan from informal sources and also to avoid over-borrowing because of social pressure.

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The study also suggest that further research should be carried out with an intention of assessing the drivers of over-indebtedness on the microfinance institution level as well as the government level in other regions of DRC.

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