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# **Gordon Institute of Business Science**

University of Pretoria

## **TOWARDS A BETTER UNDERSTANDING OF CUSTOMER LIFETIME VALUE AND OVER-INDEBTEDNESS**

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Chisava Juma

SN: 22215965

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Business Administration.

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## **ABSTRACT**

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Companies around the world have collected enormous amounts of data at the customer level, and are using different methodologies to understand their customers' behaviour. However these different methodologies have not been effective in leveraging customer information. In this study, by computing Customer Lifetime Value (CLV) scores for individual customers of a banking organisation, two segments namely high CLV and low CLV are mined. The level of indebtedness among customers in this study is identified based on the two segments mentioned above. Also in this study, a critical analysis of the literature on the association of CLV and Over-indebtedness is provided.

The results indicate that the low CLV customers are less likely to end up over-indebted. This finding negates the common viewpoint that low CLV and over-indebtedness variables are associated. A quantitative research design was chosen above a qualitative research design for this study. CLV scores for individual customers are calculated using Hwang (2004) model and a Chi-squared test is used for the hypothesis testing of the research propositions. Based on the findings and conclusions drawn from this study, several recommendations and further future research are made.

## **KEYWORDS**

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Customer lifetime value

Over-indebtedness

Chi-squared test

Hwang model

## DECLARATION

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I declare that this research proposal is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.



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Chisava Juma

10<sup>th</sup> November 2014

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# 1. INTRODUCTION

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This chapter provides the overview of the current study. The chapter commences with the brief background to the problem and the reasons for selecting this problem including a brief discussion on the research gap. The chapter then discusses relevant academic literatures pertaining to the current study. Thereafter, the chapter discusses research objectives and the benefits of the study to the business. The chapter closes with the outline of the current study.

## 1.1 THE PROBLEM DEFINITION AND PURPOSE

The ever-increasing competitive banking industry has put more pressure on banks to be subjective towards customer-centricity. The banks are now not only competing amongst themselves; but also with non-banks such as micro-lenders and other financial institutions. Nowadays the banks offer almost identical products, but to gain a competitive advantage and survive Hundre, Raj Kumar & Dileep Kumar (2013) proposed that banks need to be more effective in understanding what is satisfying their customers' needs and wants.

Kotler & Keller (2012) affirmed that the cost of attaining new customers into a company can be five times more than the cost of sustaining and retaining existing customers. This has pushed companies to look for Customer Relationship Management (CRM) tools that can analyse consumer behaviour. CRM insights are important to business leaders because they help them understand the behaviour of their customer. Business will use the knowledge acquired from customers by CRM and employ it in aligning their strategies, for example providing the products that precisely meet the customers' needs.

Different scholars have debated the relevance of Customer Lifetime Value (CLV) measurement and its importance in estimating the future profits of customers. On one hand Valenzuela, Torres, Hidalgo & Farías (2014, p.1051) argued that rather than focussing on short-term profit, the CLV also focused on "maximizing the long-run profitability". On the other hand, Kumar & Rajan (2009) reasoned that CLV measurement has shown and negated an old assertion that low risk customers are economical to serve,

but attract additional customers through word of mouth and pay more than other customers. In addition, Bailey, Baines, Wilson & Clark (2009) contended that even though CLV was difficult to calculate in practice due to problems in appropriate allocation costs it is still the best method so far in estimating the customers' future profitability.

In simple terms CLV can be defined as the expected amount of profit the customer generates during his or her entire relationship with a bank. This dissertation will identify high and low CLV customers through customer profile analysis. Kumar & Rajan (2009) have defined high CLV as the small portion of profitable customers whilst low CLV as the large portion of less profitable or even unprofitable customers to the company. The definition of CLV captures the relationship between marketing and finance in the sense that it is a "measure of how changes in customer behaviour could influence customer's future profits" (Chang, Chang & Li, 2012, p.1058).

The objective of this research is to develop an understanding of the relationship between CLV and over-indebtedness within the South African banking population. Part of this research will be to understand how some loyal banking consumers end up being a financial burden by failing to service their debt (Sherrell & Collier, 2008).

A study by Meniago, Mukuddem-Petersen, Petersen & Mongale (2013) pointed out that the proportion of household debt to income in South Africa remains significantly high at 74.7% in 2012 from previously recorded 74.8% in 2011. Raijas, Lehtinen & Leskinen (2010) defined over-indebtedness as a situation where an individual or household cannot afford to continue servicing the debt after other necessary expenditures have been paid. This is relevant within the South African context. In addition this research will not be based only on a marketing perspective like some previous research studies, but will also take cognisance of the accounting perspective.

## **1.2 REASONS FOR SELECTING THIS PROBLEM**

Every financial year, the banks in general anticipate a significantly less percentage of bad debts (also known as impairments) from their performing loans. If the bad debts are

significantly higher than anticipated, the impact on banks' operations is huge because they reduce the bank's profitability, threaten the bank's capital adequacy and reduce the bank's taxable income.

The 2008 financial crisis caused an increase in the levels of indebtedness such that many South African families were left to service an enormous amount of outstanding debt (Meniago et al., 2013). Montgomerie (2009, p.19) noted that the families who could not service their outstanding debt ended up losing their properties to banks through repossessions creating an "intense financial insecurity". Bloxham & Kent (2009, p.329) discovered that the credit supply to customers rested on the readiness of financial organisations and financial markets to provide credit. In addition, the willingness of financial institutions to provide credit to customers is also influenced by the market competitiveness, the regulatory controls and the risks associated with lending.

To a larger extent, the 2008 global financial crises bankrupted some of the banks to a point that American banks like Merrill Lynch and Countrywide Financial were acquired by Bank of America, whilst JP Morgan Chase was acquired by Bear Stearns. The main reason why these banks went bankrupt in the first place is that preceding to the 2008 global economic crisis, the financial institutions in general irresponsibly approved mortgages to customers with poor credit records. These customers eventually struggled to repay these loans resulting in the increase of the banks' bad debts and at the same time over-indebtedness among households.

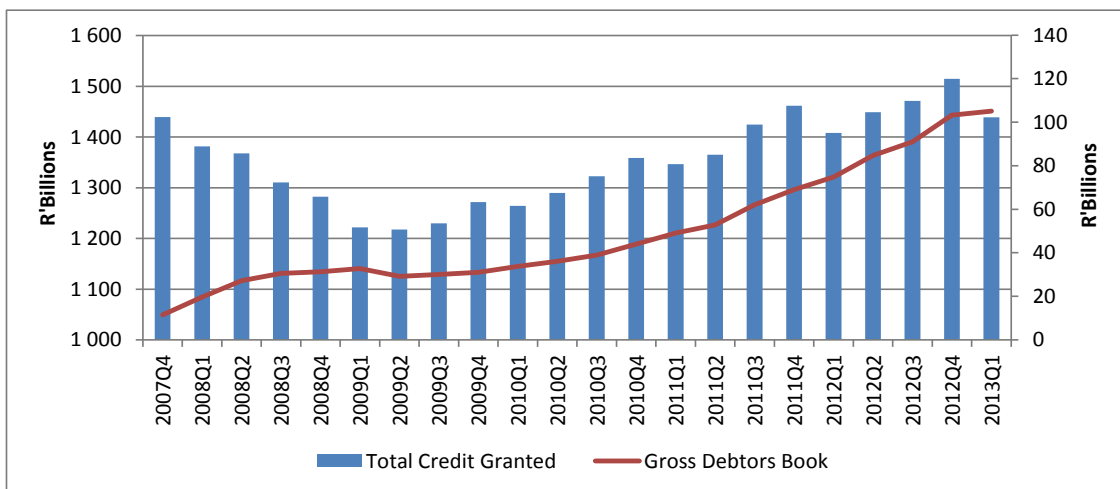
Sebehela (2009) observed that the effect of the 2008 global financial crises on the South African economy was not as severe, in comparison to the USA and European countries, but it caused a major upsurge in the proportion of total debt of households in comparison to their income. The key reason of the low severity impact was the strict credit lending criteria on banks introduced by the regulators, such as National Credit Regulator (NCR), to curb the total sum of debt that South African consumers were allowed to have.

The impressiveness of South Africa's financial market development and high accountability of its private institutions is another reason why the South African economy

was not that severely impacted by the 2008 global financial crises. Global Competitive Report 2013/2014 ranked South Africa on these two pillars second and third on the competitive index. Financial market development and high accountability of private institutions played a significant role in mitigating the economy against the effect of the 2008 global financial crises and possibly will also cushion it against any future financial crisis.

The effect of strict credit policies on the South African economy introduced by NCR is shown by Figure 1 below. Between 2007 and 2009 there has been significant drop of total credit granted. Figure 1 shows a drop by 50% in total credit granted to South African consumers from R102 billion in the last quarter of 2007 to R50 billion in the second quarter of 2009. The increase in total credit granted from the third quarter of 2009 to the first quarter of 2013 shows how the 2008 global financial crisis impacted South Africa.

**FIGURE 1: TOTAL CREDIT GRANTED AND GROSS DEBTORS BOOK**



Source: NCR (2012). Quarterly Bulletin. National Credit Regulation, Pretoria.

In order to prevent such economic crisis from happening again, the central banks and regulators both at the domestic and international level reacted by implementing strict policies and regulations that target the unscrupulous financial lending by financial institutions. Adoption of Basel III capital requirements, higher capital adequacy

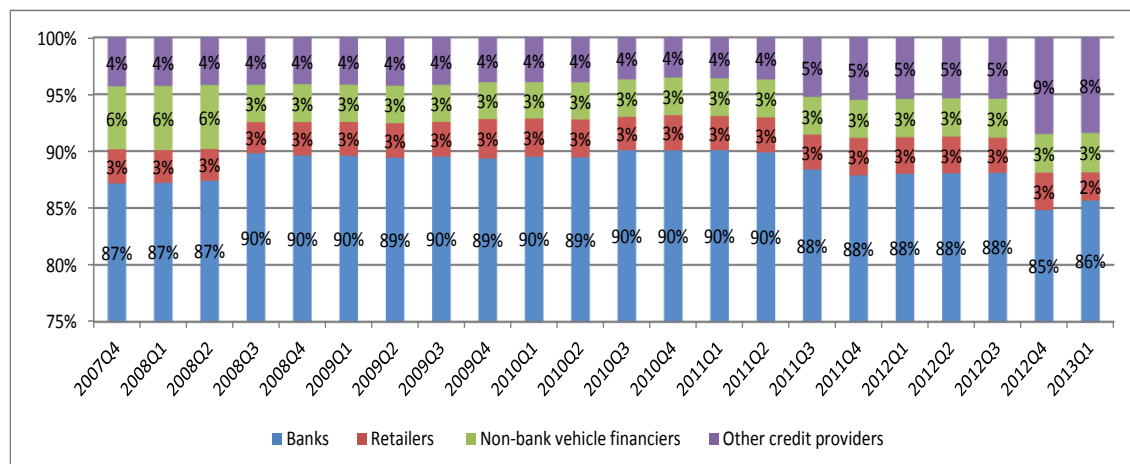
requirements, bail-in instruments and liquidity coverage ratio were some of the financial reforms implemented to bring financial stability by central banks and regulators.

Conversely it can be argued that the impact of the central banks and regulators reforms have led to a sharp costs increase for banks. The banks' costs will increase as they are now required by the central banks to hold more capital and more liquid assets to limit unscrupulous financial lending. The impact of the banks costs increase will cascade to the banks' customers because banks will always ensure an acceptable return on equity to satisfy their shareholders. Since customers are price consciousness, most of them will switch to a competitor with lower prices (banking fees) in order to get value for their money (Hattingh, Russo, Sun-Basorun & Wamelen, 2012).

### 1.3 EVIDENCE IN SUPPORT OF THIS PROBLEM

Meniago et al. (2013, p.483) found that financial institutions were the primary source of credit and to cushion against high levels of indebtedness among households, banks should be "very strict and perceptive" when lending loans to customers. Figure 2 below supports Meniago (2013) findings in the sense that, banks on average carry 90% of gross debtors' book. In other words, 90% of total South African debt has been supplied by the banks.

**FIGURE 2: GROSS DEBTOR'S BOOK- INDUSTRY TYPE**



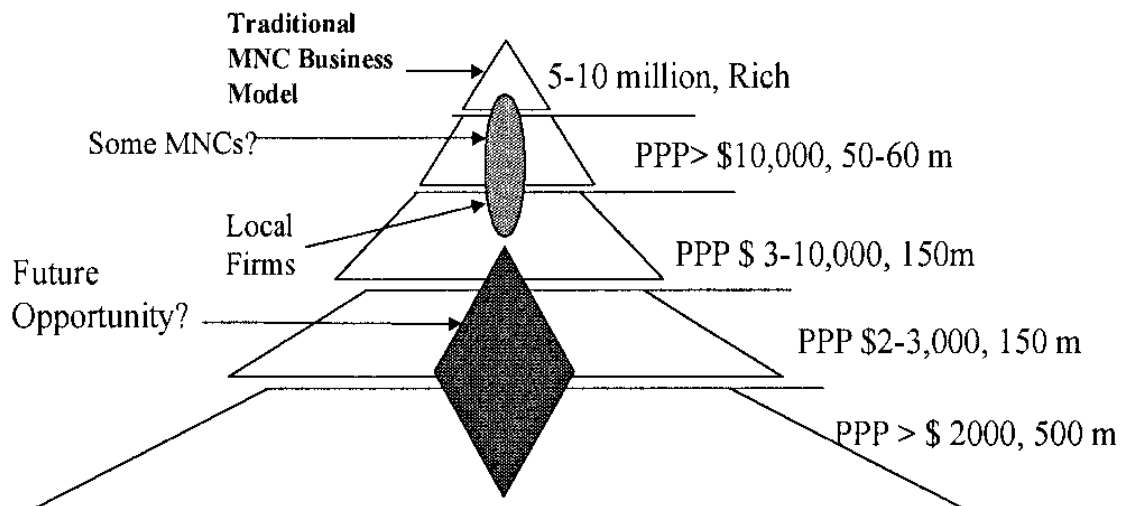
Source: Source: NCR (2012). Quarterly Bulletin. National Credit Regulation, Pretoria



Jacobs & Smit (2010) offered some interesting insights into why most South Africans have become over-indebted in the first place. They blamed financial businesses of exploitation by irresponsibly granting credit to customers who could not afford it, especially to black South Africans who were previously denied access to credit during apartheid. In support of Jacobs & Smit's (2010) above insights, Bloxham & Kent (2009, p.329) discovered that the credit supply to households rest on the preparedness of "financial institutions and markets to extend credit". This means that the financial institutions are in a position to regulate the amount of debt they extend to household families, especially to the defenceless low income earners.

Prahalad (2002) affirmed that low income earners that earn less than US\$3000 per annum belonged to the "bottom of the pyramid" (BOP). An example of India in Figure 3 below shows that approximately 75% of Indians who earns less than US\$3000 per annum belonged to BOP in comparison to 1% of the rich (top of the pyramid) who earn above US\$10000 per annum.

**FIGURE 3: TRADITIONAL AND EMERGING MARKET (INDIA)**



PPP= Purchasing Power Parity

Source: Prahalad, C. K. (2002). Strategies for the bottom of the economic pyramid: India as a source of innovation.

In addition Prahalad (2002) used the BOP theory to also argue against companies that have a negative perception mind-set towards the poor at the bottom of the socio-economic pyramid risk losing their market share in the long run. The low income earners bring exceptional opportunities to companies as they are viewed as potential consumers. Contrariwise the low income earners significantly benefit from empowerment, poverty reduction and increased productivity through foreign direct investments by these companies who are mainly multi-nationals. In the end, it's a win-win situation for the companies and low income earners.

Low income earners work in sectors of the economy such as mines, agriculture and factories where there are high income disparities. The low income earners customers end up getting trapped in the debt cycle, where they will continuously pay their debts with another debt in order to get out of debt. As a result this cycle of debt will lead to a vicious cycle of poverty that might be difficult to break for generations.

The author postulated six main causes of over-indebtedness that involves changes in peoples' personal lives like job loss, divorce, illness, spouse death, over-commitment and poor money management. Job loss due to either retrenchment or getting fired caused individuals and household families to acquire debt in order to balance their household budget. Divorce leads to over-indebtedness in the sense that one spouse will now be compelled to take over the debt burden which was previously shared by two partners. Spouse death leads to over-indebtedness in the same way as divorce mentioned above. Over-commitment occurs when an individual or households acquire more debts that surpass their total income. As a result the instalments to service these debts surpass acceptable levels. Inefficient money management leads to over-indebtedness in the same way as over-commitment.

## **1.4 IMPORTANCE AND BENEFITS OF THE RESEARCH STUDY TO BUSINESS**

Due to the limited use of CLV in South African industries, except for a few companies such as insurance, the generic CLV methodology from this research will be of high value to business managers.

Kumar & Rajan (2009) attested that proper understanding of CLV helps banks make stable decisions over time. Banks will be able to make important decisions about which customers to acquire and retain, which customers not to attain and keep, and the headcount of resources to be used during this process. In the aftermath of the 2008 global economic crises, higher risk customers found credit less available and more expensive as the banks tightened their credit lending criteria and required collateral as security.

This research will be practically of beneficial to business managers in the sense that they can use the insights found to make more applicable robust business strategies and decisions relating to customers. By understanding how to measure CLV, the banks and other companies will be able to identify and separate high risk customers from low risk customers. Bailey et al. (2009) found that besides segmenting customers according to risks, companies can also use customer insights profiles from CLV for marketing communications, financial planning and product development.

Chang et al. (2012, p.1062) stated that CLV offers valuable insights such that most companies will be able to better manage their “existing customer base”. By extensively extracting customer insights from their customer database, companies will be able to group their customers into high-value (profitable) and low-value (less profitable) segments. The above two segments are not merely for the product differentiation purposes but can also provide an unbiased reason for the company to spend more of its resources on retaining high-value customers than low-value customers.

In addition, the insights from CLV will also inform management in advance to either tighten or loosen their lending criteria as a result playing an important part in cushioning the banks

or companies against financial losses. This argument will be more relevant in times when the economy of the country is going through the turbulence of a recession. During a recession, consumers tend to borrow more to cover the short-fall in their household incomes. This is the time when the banks need to tighten their credit lending criteria. Conversely in prosperous economic times, because most consumers have more disposable income, banks need to loosen their credit lending criteria as more customers will be able to service their debt.

## **1.5 RESEARCH OBJECTIVES**

This research will be guided by the following research objectives:

- To analyse previous research studies on both CLV and over-indebtedness topics in order to establish the theoretical concept.
- To determine if customers that the bank segment as low CLV are also over-indebted.
- To determine the correlation existence of CLV against demographic dynamics such as age and gender.
- To be able to rank customers.

## **1.6 FRAMEWORK OF THE STUDY**

This dissertation is made of seven chapters.

### **CHAPTER ONE**

This chapter provides an introduction that discusses the relevant background information and the main purpose behind the current study. The problem statement is explained with the research objectives that are paramount to address the problem statement. The chapter also highlighted the importance and relevance of the research.

## **CHAPTER TWO**

This chapter focusses on an overview of the previous theoretical literature relevant to the problem statement. This chapter covers intellectual debates of different scholars about the relevance of CLV and the level of over-indebtedness of consumers in general.

## **CHAPTER THREE**

This chapter outlines the research propositions of the dissertation.

## **CHAPTER FOUR**

Chapter four gives an account of the research design and the method used to achieve the research objectives. Furthermore, it defends the use of a quantitative research design for this study. This chapter further addresses the research proposed unit of analysis, data sources, sampling method and sizes, data collection and data analysis.

## **CHAPTER FIVE**

This chapter presents the research results. The data profiling of the sample is defined in facets prior to the presentation of descriptive and inferential results. The results are reconnoitred and explained with reference to the research question.

## **CHAPTER SIX**

Chapter six discusses the outcomes from the current study results provided in Chapter five. The chapter answers propositions in Chapter three using literature review of Chapter two to support in results explanation.

## **CHAPTER SEVEN**

Chapter seven deliberates recommendations on the basis of the three research propositions, and it also put forward suggestions for the future research as well as research limitations.

## **2. LITERATURE REVIEW**

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The literature review starts by examining the intellectual debates of different scholars about the relevance of CLV and the over-indebtedness of consumers in general. This is augmented with a review of different customer valuation approaches before an examination of over-indebtedness and an analysis of how to curb over-indebtedness.

### **2.1 BACKGROUND**

Both CLV and over-indebtedness topics have been researched extensively by academics such as (Holm, Kumar & Rohde 2012; Kumar & Rajan 2009; Malthouse 2009; Lusardi & Tufano 2009). The general concepts of their research focused more on Net Present Value (NPV) accumulated by the company over the customers' lifetime transactions. Nonetheless, there are rather less coherent studies that have to the best of the authors' knowledge considered the relationship between CLV and over-indebtedness specifically in banking consumers. This study aims to fill this gap.

One probable cause for this research gap is that, marketing managers are now focussing more on randomly acquiring customers based on CLV scores because of the financial benefits it brings to the firm, without thoroughly understanding the risk of over-indebtedness that some of their customers are in. This assertion is supported by Persson (2011) who pointed out that most studies on CLV have concentrated on acquisition and general cost cutbacks in order to improve the company's overall internal efficiency.

In his comparison of CLV against opportunity analytics like propensity models, Bailey et al. (2009) discovered that the opportunity analytics classification focused on proposing the best eye-catching offer to an individual customer, whilst CLV focuses on acquiring the attractive and profitable customers to the company. This is the reason why Malthouse (2009, p.272) concluded that most companies will invest more in acquiring potential good customers in expectation that overtime the aggregate profit of these customers will eventually surpass their "cost of acquisition".

Application CLV model in companies has its own drawbacks if not carefully managed. One of the CLV shortcomings is that the cost of application to the company might be more than getting value for money. Nguyen (2012) listed the following drawbacks associated with CLV that can endanger the company's marketing efforts: breaching of customer privacy, bias in the direction of profitable customers, vigorous pricing, and unseen surcharges.

Favouritism towards profitable customers is the most risky one among the above listed pitfalls for the banks. Since companies lack sound management strategies on how to manage favouritism, they end up losing customers they previously segmented as non-profitable with future potential of being profitable customers to their competitors. Valenzuela et al. (2013, p.552) explained that rather than only measuring the customers average profitability, CLV should be measured at a "segment level to differentiate" profitable customers from non-profitable customers to the company.

## **2.2 CUSTOMER LIFETIME VALUE**

In this study we use CLV or LTV as the abbreviations that denote customer life time value. Hwang, Jung & Suh (2004) broadly defined CLV as the addition of profits obtained from the customers across the lifespan of transactions after the total cost of acquisition, retailing, and servicing customers have been netted and taking note of the time value of money.

### **2.2.1 CUSTOMER LIFETIME VALUE DEFINITIONS**

In marketing, CLV is defined as the "net present value of the stream of future profits expected over the customer's lifetime purchases" (Kotler & Keller's, 2012, p.105). Qianpin (2010, p.650) defined CLV as the "profit streams of a customer across the entire customer life cycle". On the other hand, Qi, Zhou, Chen & Qu (2012, p.283) defined CLV as the "net profit or loss to a firm from a customer over the entire life of transactions of that customer with the firm".

Table 1 illustrates previous research's CLV definitions over the years by different authors. This table signifies that the differences in meanings are small.

**TABLE 1: CLV DEFINITIONS**

<b>Definition</b>	<b>Article</b>
The present value of all future profits generated from a customer	Gupta and Lehmann (2003)
The net profit or loss to the firm from a customer over the entire life of transactions of that customer with the firm	Berger and Nasr (1998)
Expected profit from customers. exclusive of costs related to customer management	Blatterg and Deithon (1996)
The total discounted net profit that a customer generates during her life on the house list	Bitran and Mondscein (1996)
The net present value of the stream of contributions to profit that result from customer transactions and contacts with the company	Pearson(1996)
The net present value of a future stream of contributions to overheads and profit expected from customer	Jackson (1994)
The net present value of all future contributions to overhead and profit	Roberts and Berger (1989)
The net present value of all future contributions to overhead and profit expected from customer	Courtheaux (1995)

Source: Hwang, H., Jung, T., & Suh, E. (2004). An LTV model and customer segmentation based on customer value: A case study on the wireless telecommunication industry.



### **2.2.2 CUSTOMER BEHAVIOUR**

The analysis of customer behaviour is paramount to any company. In order for companies to construct a sustainable lasting lucrative relationship with their customers, they need to correctly identify and segment customers according to their characteristics. The advantage of identifying and segmenting customers is that they can be retained and incentivised to stay. Dhandayudam & Krishnamurthi (2014) established in a study that segmented customers are defined by rules which depict their behaviour. These rules can be used by businesses areas such as Marketing. When acquiring new customers, marketing managers forecast their behaviour trends against the existing customers to understand if they will be good customers or bad customers.

### **2.2.3 CONCEPT OF VALUE**

The concept of value as explained by Kotler & Keller (2012) has to do with the benefits of the perception monetary value customers anticipate from any given transaction such as economic and psychological. Companies that have not yet mastered the customers' concept of value have made dreadful mistakes when it comes to customer retention. These companies have under-invested in high value customers and over-invested in low value customers.

The concept of value from the customer's perspective is the variance between profits and costs paid (Ndregjoni & Gega, 2012). In simple terms the concept of value from the customer's perspective can be viewed as the efficacy that customers acquire after purchasing any product or service. In addition, Ndregjoni & Gega (2012) argued that in the customer's perspective the market determines the value and the customer only feels the value when he or she gains from any transactions with the company.

The concept of value from the shareholder's viewpoint is merely the profitable relationship with the customer. The more companies can acquire or keep the loyal customers, the more these companies will increase their profitability and market share over time. Qianpin (2010) established in a study that customer value is attained by increasing the shareholder

value. This might be the reason why some companies are increasing their investments in areas where they can make a valuable relationship with their customers.

#### **2.2.4 CUSTOMER LIFETIME MODELS**

The ultimate goal for any company or business is to make profit. In order to maximise profits companies have resorted to customer valuation models. There have been many key models such as RFM, Cash flow, and Markov chain models that have been proposed to calculate CLV (Chang, Huang & Wu, 2010).

##### **RFM MODEL**

The RFM model was first proposed by Dwyer (1997). It is a widely known customer valuation analysis method that is used in customer segmentation and it is important for measuring CLV (Chang et al., 2010). Sherrell & Collier (2008) defined the RFM model as one of the best indicators of customer value that not merely analyses the past customer transaction behaviour but can also ascertain proactive action steps and strategies that can influence imminent outcomes. Tukul & Dixit (2013, p.471) defined the past value of a customer as the gross “profit contribution” to a company.

R (Recency) indicates the period from the time of the customers' last transactions, which is the time differences between the present and previous transactions date (Dhandayudam & Krishnamurthi, 2014). A lower percentage will signify the higher likelihood of the customer making a repeated transaction. F (Frequency) indicates the total of transactions that a customer has done within a certain period (Chang et al., 2010). A frequency that is higher indicates bigger loyalty. M (Monetary) indicates the total value of transactions a customer used up throughout a certain period (Dhandayudam & Krishnamurthi, 2014). A value that is higher demonstrates that the company should concentrate more or overspend more on that customer.

The drawbacks of using the RFM model as affirmed by Sherrell & Collier (2008, p.40) is that you cannot forecast or predict the transaction behaviour of a customer over a “long term” mainly because it is not a statistical modelling technique. Another drawback of using

the RFM model is that it fails to articulate what is driving the customer's transaction behaviour. The RFM models also fails to adequately segment the majority of customers like the low CLV who have made low monetary transactions for companies (Qi, Zhou, Chen & Qu, 2012).

### **CASH FLOW MODEL**

The cash flow model was first proposed by (Bayon, Bauer & Gutsche, 2002). The cash flow model is also known as the potential value of a customer. Sherrell & Collier (2008) defined the Cash Flow model as the net profit that customers contribute into the company over their lifetime with the company. Tukul & Dixit (2013) defined the cash flow model as the anticipated profit that can be obtained from the customer in a given period of time. Sherrell & Collier (2008) stated that the cash flow model advances upon the historical view of the RFM model.

The drawback of using the cash flow model is that it relies too much on an assumption that the management knows how long the customer will stay with the company. Another disadvantage of using the cash flow model as argued by Chao, Gin-Yuan & Yung-Ching (2009) is that attrition prediction of customers from a company is not only difficult but if done the results will be unreliable as customers leave a company for different reasons.

### **MARKOV CHAIN MODEL**

The Markov Chain Model (MCM) is a mathematical model that was originally introduced by Pfeifer and Carraway in 2000. Permana, Indratno & Pasaribu (2014) found out that companies can use MCM to not only gauge suggested customer relationships but also to help manage and develop these relationships. The major advantage of MCM is that it can explain both the retention of a customer and circumstances of customer migration.

The drawback of the MCM is that it assumed that all customers will do transactions at the same time period which is far from the reality (Permana, Indratno & Pasaribu, 2014). Sherrell & Collier (2008) criticised RFM, Cash Flow and Markov Chain models because they are narrowly focused on an organization's current customer base and they do not

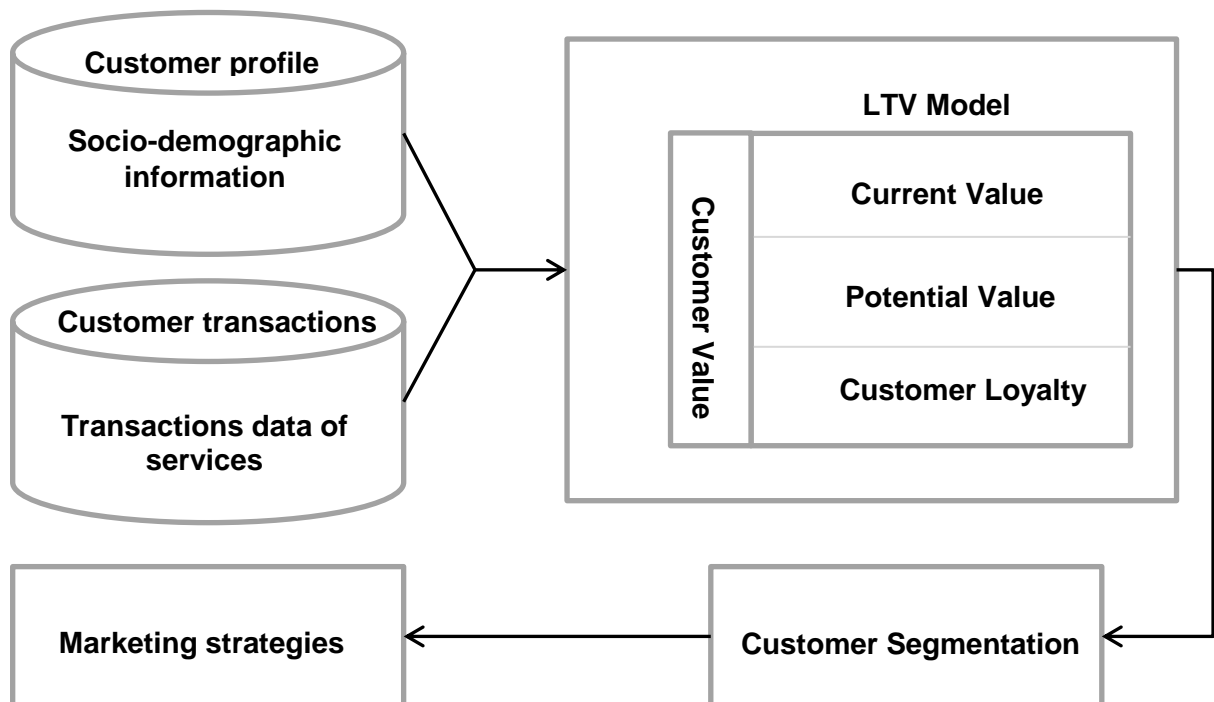
take into account the impact of future customers. In addition the basic concepts of these models focussed more on Net Present Value (NPV) acquired from transactions of customers within the period they have been with the company.

## HWANG MODEL

Hwang, Jung & Suh (2004) proposed a new perspective of customer valuation through expansion of NPV-based models by considering the customer's past profit contribution (current value), potential benefit (potential value), and customer loyalty index (customer loyalty). In summary the Hwang model takes into account both past profit contribution and the predicted value of the customer.

Figure 4 shows how Hwang et al. (2004) expanded the NPV-based models by including the three perspectives: current value, potential value and customer loyalty.

**FIGURE 4: CONCEPTION HWANG'S MODEL FRAMEWORK**



Source: Hwang, H., Jung, T., & Suh, E. (2004). An LTV model and customer segmentation based on customer value: A case study on the wireless telecommunication industry.

### Current Value

Hwang et al. (2004) defined past profit contribution (current value) as the present-day value of past profits contributed by a customer. In addition Hwang et al. (2004) says current value computation is simple. The past profit contribution (also called current value) is calculated as:

$$\text{Current value} = \left[ \underbrace{\sum_{t_i=0}^{N_i} \pi_p(t_i)(1+d)^{N_i-t_i}}_{\text{Past Profit Contribution}} \right] \quad (1)$$

Where:

$t_i$  Service period index of customer  $i$

$N_i$  Total service period of customer  $i$

$d$  Interest rate

$\pi_p(t_i)$  Past Profit contribution of customer  $i$  at period  $t_i$

### Potential Value

Chao et al. (2009) defined future profit contribution (potential value) as the profits generated by a company from cross selling other available products to a customer. Hwang et al. (2004) agreed with the assertion that the computation of future profit contribution is difficult. He stated that the uncertainty associated with the customer's future behaviour is making such prediction produce inaccurate analysis. Future profit contribution (also called potential value) is calculated as:

$$\text{Potential value} = \left[ \underbrace{\sum_{t_i=N_i+1}^{N_i+[1/P_{\text{churn}}(i)]+1} \frac{\tilde{\pi}_i(t_i) + \tilde{B}(t_i)}{(1+d)^{t_i-N_i}}}_{\text{Expected Future Cash Flow}} \right] \quad (2)$$

Where:

$P_{\text{churn}}$  Expected churn rate of customer  $i$

$\tilde{\pi}_p(t_i)$  Future profit contribution of customer  $i$

$\tilde{B}(i)$  Potential benefit of customer  $i$

### Customer Loyalty

Previous researches were limited to forecasting the future profit of customers using the past profit history (Hwang et al., 2004). These studies excluded the churn rate when computing CLV. Tukul & Dixit (2013) defined customer loyalty as the likelihood that the customer would remain a customer of a company. In addition customer loyalty is measured as

$$\text{Customer loyalty} = [1 - \text{churn rate}] \quad (3)$$

Where:

Churn rate is the attrition of customers (or a number of customers who stopped using services) from a company.

NCA (2012) calculated the average personal loan churn rate of the top four South African banks' to be 24%. The customer loyalty will be 76% for the personal loan product if the churn rate is 24%. Dhandayudam & Krishnamurthi (2014) argued that customer churn rate

is an important element in CLV calculation. The reason they gave is that it determines the level of the period serviced and the future value generation. In order to condense customer churn, companies need to measure the retention rate and identify the attrition root cause through analysis in order to select the areas they can manage properly (Kotler & Keller, 2012).

The loyal customer approach uses customer loyalty as a sample for estimating the CLV. The criticism of the loyal customer approach according to (Sherrell & Collier, 2008, p.41) is that it fails to capture the convolution of customer loyalty in situations where it considers the customers that are neither “heavy purchasers” or regularly switch to different competitors as loyal.

### Hwang CLV

Since Hwang CLV methodology considers the customer churn rate that is important in companies’ forthcoming revenue generation in comparison to other CLV methodologies. This is the main reason why this paper adopts the Hwang (2004) model. Hwang lifetime value of customer  $i$  is depicted by summing equation (1) plus equation (2) plus equation (3) such that

$$CLV_i = \left[ \underbrace{\sum_{t_i=0}^{N_i} \pi_p(t_i)(1+d)^{N_i-t_i}}_{\text{Past Profit Contribution}} \right] + \left[ \underbrace{\sum_{t_i=N_i+1}^{N_i+[1/P_{\text{churn}}(i)]+1} \frac{\tilde{\pi}_f(t_i) + \tilde{B}(t_i)}{(1+d)^{t_i-N_i}}}_{\text{Expected Future Cash Flow}} \right] \quad (4)$$

## **2.3 OVER – INDEBTEDNESS**

Over-indebtedness is a situation where an individual or household cannot afford to continue servicing their debt after other necessary expenditures have been paid (Raijas et al., 2010). In this study, over-indebtedness will be denoted as the total Personal Loan arrears of the customer. NCR (2012) reported that of the 20.2 million South Africans who are credit consumers, 9.69 million (48%) are three or more months in arrears (over-indebted). Raijas et al. (2010) argued that the over-indebtedness is considered a multi-dimensional occurrence that is a financial, social, and a political problem.

### **2.3.1 THE CONCEPT OF OVER-INDEBTEDNESS**

Gathergood (2012) discovered that the age, marital status, education, unemployment rates of a customer and over-indebtedness is correlated. In his study, he found that over-indebtedness is high among household families who are younger, single but have children, possess less education qualifications, higher proportion of unemployment, poorer lower proportion of home tenure and higher proportion of private and social renting. Kumar & Rajan (2009) identified similar characteristics of over-indebtedness as Gathergood (2012) but were more specific, for example: low income, single male customers within the age group of 24 years to 44 years. This shows that low CLV, who in the above example are known as low income earners, is a key variable in forecasting a consumer's propensity for incurring debt (Jacobs & Smit, 2010).

Factors that influence over-indebtedness in developed economies and developing economies are different. In developed economies Bloxham & Kent (2009, p.329-331) listed the following as drivers of over-indebtedness such as "Financial Sector Deregulation, Declining Inflation, Declining Costs, Reduction in Macroeconomic Volatility, Lower Unemployment Rates and ageing of the Population". Meniago et al. (2013) argued that the optimistic fluctuations in mortgage prices, inflation, Gross Domestic Product, consumer consumption expenditures and consumer savings, boosting households families to borrow more and increasing household debt at the same time. Lusardi & Tufano (2009) and



Gathergood (2012) argued that the lack of financial literacy and lack of self-control are the main drivers of over-indebtedness.

In developing economies, Schicks (2013) postulated that income uncertainty and adverse economy shock are main drivers of over-indebtedness. Prior to the National Credit Act (NCA), Jacobs & Smit (2010) affirmed that the factors that drive South Africans into over-indebtedness were the concept of materialism (which is the status that a consumer attaches to worldly possessions), escalating house prices, and unscrupulous creditors flooding the market with credit after June 2005. All the above drivers can be consolidated and viewed at a consumer, lenders and external stages.

### **2.3.2 CONSUMER LEVEL FACTORS**

#### **SOCIO-DEMOGRAPHICS**

Bank customers' risk of individual over-indebtedness differ according socio-demographic upbringing. Schicks (2014, p.303) found that in the United Kingdom (UK) having "more children reduces risk". This is because children encourage parents to be financial disciplined. Ultimately this finding negates the common viewpoint that having many children in the household is positively correlated to over-indebtedness. In addition, Raijas et al. (2010) found out that the changes in peoples' private lives like job loss, divorce, illness, and spouse's death may play mayhem with a household's economy because of the reliance on a single income, combined with prolonged behaviours and expenditures that were suitable for a not the same economic situation.

#### **FINANCIAL LITERACY**

Lack of financial literacy is another consumer level factor that drives over-indebtedness. Gathergood (2012) findings in his study showed that financial illiteracy is definitely correlated with non-servicing of consumer credit leading to unwarranted over-indebtedness. In addition Gathergood (2012) found that 40% of CLV customers exhibited a low level of financial literacy even in developed nations such as the US. In support of Gathergood 's (2012) findings, Lusardi & Tufano (2009) argued that lower debt literacy

individuals have a tendency to transact in high-cost behaviours, using high-cost borrowing, and incurring higher fees. In addition, Lusardi & Tufano (2009) found out that low levels of debt literacy and empathetic of the simple technicalities of debt is restricted among the elderly, women, certain minorities, and people with lower incomes and wealth. This means that the thinking capabilities of an typical individual are low compared to the intricacy of financial decisions, and those with lower debt literacy endure an inconsistent large share of preventable costs and as a result will be likely to be over-indebted (Schicks, 2014).

## **SELF-CONTROL**

Lack of self-control is another consumer level factor that drives over-indebtedness. Gathergood's (2012) findings in his study showed that self-control is definitely correlated with non-servicing of consumer credit leading to unwarranted over-indebtedness. In addition, Gathergood (2012) postulated that lack of self-control intensify exposure to a range of risks such as store credit cards which entice the customers to have spent excessively on durables.

## **ECONOMIC**

Income uncertainty is an economic factor that drives over-indebtedness. Schicks (2014) learned that during low income periods like unemployment when the income is unstable, most consumers do not have the means to service their debt because most of their loan instalments payments are fixed. Raijas et al. (2010) noted that it is tough to plan an individual budget whilst earning lop-sided income. The reason is that during lop-sided income, a consumer will be attracted to pay off for his/her low-cut earnings by taking the most expensive kind of consumer credit.

An adverse economy shock is another economic factor that drives over-indebtedness. Adverse shocks like loss of employment, marital disintegration, economic crises and natural disasters reduce consumers' capability to pay back debt and can initiate a condition of over-indebtedness (Schicks, 2014). Gathergood (2012) concurred with Schicks (2014) findings that over-indebted consumers are likely to have experienced forms

of financial shockwaves such as job loss, credit withdrawal and a major expense than 'debt free' consumers. The statistics produced by Rajjas et al. (2010), showed that the most common reasons for the consumer's over-indebtedness are lack of control of consumption (18%), divorce (17%), unemployment (14%) and unexpected events (9%).

### **2.3.3 LENDERS LEVEL FACTORS**

#### **INTRODUCTION OF STORE CARDS**

Jacobs & Smit (2010) argued that the introduction of store cards in the 1990's caused over-indebtedness in South African households reaching the all-time high of 61% between 1994 and 1996. Another point to note is that South Africa attained a democratic independence in 1994 by removing the Apartheid regime from power. This meant that the majority of the South African population who are black were now eligible for consumer credit loans.

#### **NATIONAL CREDIT ACT (NCA)**

The National Credit Act is another lender's level aspect that drives over-indebtedness. In South Africa before the introduction of NCA in 2007, banks and other unscrupulous credit providers submerged the market with easy consumer credit such that it reached an all-time high between June 2005 and June 2007 (Jacobs & Smit, 2010).

#### **THE 2007 US SUBPRIME MORTGAGE CRISES**

An excessively optimistic economic outlook on the credit lenders in the United States in 2007 increased over-indebtedness across the world. During this period, lenders mostly financial institutions were approving home loans to many non-deserving lower-income households. A lot of the low income earners would not have qualified under the previous stricter lending criteria. As a result, this unscrupulous lending resulted in a percentage increase of home ownership within short period of time (Bloxham & Kent, 2009). Wisman (2013) argued that the housing market was to a larger extent driven by very low interest rates restricting the US Reserve Bank (Fed) to a stimulate spending on credit.

The 2008 financial crisis blocked credit extension to individuals and businesses therefore generating credit crises. This had a knock-on effect that resulted in recessions in many developed economies. Financial institutions especially banks suffered substantial financial losses to an extent that some businesses closed whilst many others requested government support through “bail-out” (Bloxham & Kent, 2009).The “bail-out” were the public tax money that the government lend to affected businesses on condition they repay it over an agreed period and the government becomes part of the company shareholders. In this context, Meniago et al. (2013, p.483) said that the 2008 financial crisis was to a “large extent a debt crisis”.

#### **2.3.4 EXTERNAL LEVEL FACTORS**

##### **UNEMPLOYMENT RATES**

In advanced economies, Bloxham & Kent (2009) argued that a low unemployment rate increase both demand and supply of credit resulting in the demand increase for debt. In contrast, Meniago et al. (2013) contended that in developing economies, like South Africa, a high unemployment rate is due to fewer jobs being produced in the economy. Ultimately this will restrict income into the household sector and as a result more people will acquire debt.

##### **AGEING OF THE POPULATION**

Bloxham & Kent (2009) discovered that in advanced economies the upsurges in long life and a decline in fertility may lead people to hold debt for longer and permitted financial institutions to extend credit to older people.

##### **INCOME DISPARITY**

The growing level of income discrepancy between employees of different economic sectors drives over-indebtedness. In contrast to Ger & Belk’s (1996) findings which stated that income disparity creates a curbed longing to consume; Jacobs & Smit’s (2010) believed that the increase in income distribution gave rise to increased demand for credit,

especially among the bottom of the pyramid families (also known as the low-income earners).

### **HIGHER GDP**

Meniago et al. (2013) found that higher Gross Domestic Product (GDP) drives over-indebtedness. Higher GDP signifies a higher income which implies that the creditors will be very self-assured in dispensing more debt. Since South Africa is one of the top ten countries with the highest income disparity in the world. This was attested by Meniago et al. (2013, p.488) who supposed that benefits from higher economic growth enjoyed among households is not always “equally shared”.

### **RISE IN HOUSE PRICES**

The increase in house prices drives over-indebtedness. Between 2004 and 2005 house prices in South Africa grew at around 20% to 30% per year, increasing to a larger extent the household debt to unacceptable levels (Jacobs & Smit, 2010). Between 2000 and 2008, the prices of old flats in Finland sharply increased by 50% (Raijas et al., 2010). In a scenario where these house prices drops, household capital would significantly contract causing big financial crisis such as the 2007 US subprime mortgage crisis.

### **HIGHER HOUSEHOLD CONSUMPTION EXPENDITURES**

In Montgomerie's (2009) study, United States (US) is the number one consumption country in the world and its economy is greatly depended on personal consumption to strengthen its economic growth. Meniago et al. (2013) supported the statement that higher consumption expenditures by household families' leads to over-indebtedness. Households, if faced with the shortage of income in their pockets, will end up borrowing debt in order to meet all their expenses.

## **INFLATION**

Meniago et al. (2013) found that when inflation increases, households will be encouraged to borrow more and as a result increasing the risk of over-indebtedness. In contrast Bloxham & Kent (2009) argued that lower inflation shrinks nominal interest rates, and reduce preliminary repayments to such an extent that they are no more than some static segment of the consumers' income.

## **INTEREST RATES**

Montgomerie (2009) supported the statement that interest rates drives over-indebtedness. Montgomerie (2009, p.10) said that decreasing inflation rates causes 'nominal interest rates to decrease', and with an increase in credit availability this will trigger creditors to lend more to consumers. Bloxham & Kent (2009) noted that a decrease in interest rates drives an increase in over-indebtedness. In addition, Bloxham & Kent (2009) argued that even after a decrease in interest rates, the household interest payments are not amplified as considerably as debt.

### **2.3.5 SUGGESTIONS TO CURB OVER-INDEBTEDNESS**

The following are possible suggestions proposed to eradicate over-indebtedness levels among indebted consumers.

## **EMPLOYMENT CREATION**

To curb income discrepancies Meniago et al. (2013) suggested that more jobs needed to be produced in the economy, as this will thrust more income into households' families and result in a lesser amount of debt. Housewives need to be encouraged to get jobs so as to help to alleviate households' debts. The government should play its part to lessen the income inequality in the country through charging rich individuals and businesses high tax so that the economic growth benefits could be enjoyed by all (Meniago et al., 2013).

## **TIGHTENING LENDING CRITERIA**

To deter the rise in mortgage rates Meniago et al. (2013) recommended that during credit dispensing, affordability circumstances should be scrutinised attentively and loans should be extended only to households with sound credit history. This will enhance not only the creditors to be more proficient in lending out of loans but also to the households who will gain financial literacy and be more responsible when acquiring debt. In addition Meniago et al. (2013) also recommended that a tighter regulation of the housing market by the government is needed in order to arrest and remove unscrupulous financial creditors.

## **MEN NEED TO SEEK DEBT ADVICE**

In order to improve in self-control when it comes to money budgeting, Goode (2012) suggested that men needed to seek debt advice. To support his argument Goode (2012) said that most men want to be “debt free” but because they don’t get good advice they end up in over-indebtedness. Goode (2012) used an example of UK Consumer Credit Counselling Service for debt advice that recorded an increase to 51% since 2007 of the number of men contacting it. Meniago et al. (2013) also recommended that households have a duty to spend their income sensibly so as to avoid getting trapped in debt.

## **FINANCIAL LITERACY NEEDED**

From the consumer's perspective, Sebehela (2009) recommended that more education before taking out loans is required for consumers to properly understand about the availability of various loan products and the different types of risks involved if they happen to get loans. In addition, Raijas et al. (2010) also recommended that customers must be given proper financial information that is informal, easier to understand and directly connected to their lives and the style of their language.

Since South Africa is not immune to any global financial crisis like the 2008, it is advisable for South African financial institutions to pay more consideration to the consumers’ “financial capacity” when lending credit such as the level of education, spending behaviour as well as employability (Sebehela, 2009, p.46).

## **REGULATE INTEREST RATES**

Meniago et al. (2013) advised that interest rates act as certified tools applied by different countries to regulate the volume of credit extended to the private sector should be controlled wisely. At the same time precautions should be taken to prevent huge economic shocks, because shocks on interest rates have an effect on other variables such as household debt in particular (Meniago et al., 2013).

## **ACTIVE DISCUSSION**

Raijas et al. (2010) proposed active discussion on the problem of debt itself, identifying the root causes and an exploration for tools to solve debt problem. In addition, a productive debate about the symptoms and precautionary instruments of the problem are also important.

### **2.3.6 CONCLUSIONS**

The literature review has revealed that there are more benefits associated with implementation of CLV in companies than challenges. It is clear that pick out and developing customers based on CLV scores increases the company profitability as the company will be able to distinguish valuable from unprofitable customers. The author is aware that calculating CLV scores using Hwang model might be challenging, especially when it comes to the prediction of expected customer loyalty. However the Personal Loan customer loyalty will be derived from the proxy churn rate on NCA (2012) website.

The literature review also conveyed to forefront the problems that debt cycle has affected different segments of society in the world. Most problems identified that caused over-indebtedness, originated from the 2008 financial crisis. The 2008 financial crisis devastated the world economies into recessions. However, the author put forward some suggestions sourced from different academic authors to curb over-indebtedness.

Chapter three presents a thorough depiction of the research propositions that was used in the current study.



### 3. RESEARCH PROPOSITIONS

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The aim of this study was to examine the existence of over-indebtedness within CLV banking customers. The following are research propositions:

#### 3.1 RESEARCH PROPOSITION ONE

**Low CLV customers are more likely to end up over-indebted than high CLV customers?**

This research will provide a robust understanding of how over-indebtedness among high CLV customers (“revenue leaders”) has distorted the long held idea that profits will increase over time with loyal customers. However Sherrell and Collier (2008) have noted that profitability over time is created by low income customers (low CLV) who generate low revenue streams than loyal customers (high CLV) who generate high revenue for company. High CLV customers are mostly loyal, know their worth and as such request more superior service causing the company costs to exceed the profit over time. On the other hand, low CLV are not expensive to attain and retain, the company profit even though marginal in comparison to high CLV will remain lower than the profits over time.

Kumar & Rajan (2009) identified a high CLV as a professionally employed married woman with children in the 30 to 49 age group, whilst low CLV as a low income, single male customer between age group of 24 years to 44 years. Rather than discriminating and eliminating non-profitable customers, Sherrell and Collier (2008) believed that non-profitable (low CLV) and profitable (high CLV) customers must be aggressively managed in order to secure the long term success of an organization.

Kumar & Rajan (2009) discovered segmentation of customers based on profitability and loyalty as shown in Figure 5. True Friends are the most loyal and profitable customers to

the company. These are the type of customers that most companies wish to have on their portfolios. Butterflies are profitable customers but their problem is that they are not loyal to the company. They “hop, step and jump” to different companies looking for premium services at a lower costs. Barnacles are the type of customers who are less profitable to the company despite being loyal to it for a long time. Strangers are customers who are not profitable and least loyal to the company. The company will be better without them.

**FIGURE 5: SEGMENTATION OF CUSTOMERS BASED ON PROFITABILITY AND LOYALTY**

Customer Lifetime Profits	High	<p><b><u>BUTTERFLIES</u></b></p> <ul style="list-style-type: none"> <li>• Good fit between company’s offerings and customers’ needs</li> <li>• High Profit potential</li> <li>• Action <ul style="list-style-type: none"> <li>○ Aim for transactional satisfaction, not attitudinal loyalty</li> <li>○ Maximize profits from these accounts as long as they are active</li> <li>○ Stop investing once inflection point is reached</li> </ul> </li> </ul>	<p><b><u>TRUE FRIENDS</u></b></p> <ul style="list-style-type: none"> <li>• Excellent fit between company’s offerings and customers’ needs</li> <li>• Highest profit potential</li> <li>• Action <ul style="list-style-type: none"> <li>○ Consistent intermittently spaced communication</li> <li>○ Achieve attitudinal and behavioral loyalty</li> <li>○ Invest to nurture/defend/retain</li> </ul> </li> </ul>	
	Low	<p><b><u>STRANGERS</u></b></p> <ul style="list-style-type: none"> <li>• Little fit between company’s offerings and customers’ needs</li> <li>• Lowest profit potential</li> <li>• Action <ul style="list-style-type: none"> <li>○ Make no investment in these relationships</li> <li>○ Make profit on every transaction</li> </ul> </li> </ul>	<p><b><u>BARNACLES</u></b></p> <ul style="list-style-type: none"> <li>• Limited fit between company’s offerings and customers’ needs</li> <li>• Low profit potential</li> <li>• Action: <ul style="list-style-type: none"> <li>○ Measure size and share of wallet</li> <li>○ If share-of-wallet is low, focus on specific up and cross selling</li> <li>○ If size of wallet is small, impose strict cost controls</li> </ul> </li> </ul>	
		Low	Relationship Duration	High

Source: Kumar, V., & Rajan, B. (2009). Profitable customer management: Measuring and maximizing customer lifetime value. *Management Accounting Quarterly*

Pareto theory states that for many occasions approximately 80% of the effects come from 20% (Garzia, 2010). Not surprisingly Tukul & Dixit (2013) noted that CLV for the most valuable customers increases exponentially and the top 28% of customers constitute 80% of the total value of all customers also following a Pareto principle.

### 3.2 RESEARCH PROPOSITION TWO

**Young age group customers are more likely to end up over-indebted than old age group customers?**

Over-indebtedness is more prevalent in the younger age group because of their limited understanding and flimsy choices, whilst the older age group with children are less indebted, as they have the most financial obligations (Raijas et al., 2010). Jacobs & Smit (2010) discovered that age and indebtedness is negatively correlated, implying that a younger age group are more indebted than an older age group. Raijas et al. (2010, p.214) noted the main reason why young people are entangled in debt is that they maintain their lifestyle status through more “consumption” (Raijas et al., 2010, p.214).

### 3.3 RESEARCH PROPOSITION THREE

**Male customers are more likely to end up over-indebted than female customers?**

Jacobs & Smit (2010) proposed that gender and indebtedness are to a larger extent positively related. This means that males demonstrate higher levels of indebtedness than females. Goode (2012, p.328) argued that men exert more control over the household income, making women to have accountability for the daily management of low incomes to an extent women become more probable than “men to seek debt advice”.

Chapter four will present the quantitative design method used for the current study. This is followed by a discussion of process of how the research results were obtained.

## **4. RESEARCH METHODOLOGY**

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In this chapter, the quantitative design method used for the current study will be presented. This is followed by a discussion of process of how the research results were obtained, starting with the data collection, sample design, research instrument and data analysis. In addition, ethical considerations will also be deliberated.

### **4.1 SCOPE OF THE STUDY**

The scope of the study is to get a first-hand understanding about the relationship between CLV and over-indebtedness in the South African banking environment. All personal loan customers of one bank in South Africa form the scope of the study.

### **4.2 RESEARCH DESIGN**

#### **4.2.1 QUANTITATIVE**

The research design that is appropriate for this study was considered to be the one that can allow empirical testing; for which quantitative, secondary data can be obtained. As a result the descriptive secondary data research method was selected.

The following are some of the reasons why a quantitative research design was chosen above a qualitative research design for this study:

- (a) Quantitative is the best design when determining the level of association between variables (Saunders & Lewis, 2012). This study will be examining if there is an association between CLV and over-indebtedness.
- (b) It is very useful when studying large data (Carr, 1994). In this dissertation we are studying 8,654 personal loan accounts
- (c) It is very useful when a lot is known about the problem (Saunders & Lewis, 2012). Extensive research has been done by authors such as Kumar & Rajan (2009) on CLV and Gathergood (2012) on over-indebtedness.

- (d) It can accommodate the use of a Statistical Analysis Software (SAS) package (Version 9.3) which makes the analysis less time consuming and the research findings are comparatively independent of the researcher (Kelle, 2006).
- (e) It has a higher trustworthiness with people in power such as business executives who require comfort of numbers (Saunders & Lewis, 2012).
- (f) It is useful in testing and authenticating already built theories about how and why phenomena occur (Carr, 1994). In this dissertation Hwang (2004) model concepts will be tested where they are relevant in a banking environment.

### **4.3 DATA COLLECTION**

#### **4.3.1 SECONDARY DATA**

The current study includes the collection of secondary data for thorough investigation. The proprietary secondary data was gathered from a single South African bank warehouse through data mining. Data mining is the use of powerful computers to extract through and analyse volumes of data to ascertain patterns about an organizations customers, products and activities (Kelle, 2006). The reason why secondary data was chosen is that:

- (a) It is difficult to get sophisticated primary data like the CLV data for banking customers in this research through a survey as its usually private and confidential information (Saunders & Lewis, 2012).
- (b) Besides being less expensive than acquiring primary data, secondary data can be obtained rapidly (Saunders & Lewis, 2012).
- (c) It is useful when acquiring big datasets like the 8,654 personal loan accounts that was used for this research.

During evaluation of the secondary data the following checks on the data were done.

- (a) The data was reliable in answering the research propositions highlighted in Chapter Three.
- (b) The data was relevant in the time period of the research objective of 36 months.

- (c) The data does apply to the population of interest which is customers with a personal loan product.
- (d) It is possible to go to the original source of data, which is the company data warehouse
- (e) There is no possibility of bias in the data because the accounts of customers were randomly selected from the company warehouse.
- (f) The accuracy of this data can be verified.

The secondary data contains a single product called Personal Loan. The Personal Loan data consists of all accounts opened in the last seven years. Personal Loans are appropriate when purchasing expensive products such as appliances, furniture or transacting large payments like school fees. The Personal Loans are only given to South African citizens who earn a salary of R3, 000 per month or from R36, 000 annually.

Personal Loan data was used to calculate the CLVs of customers based on the past value, the potential value, and their loyalty (Tukel & Dixit, 2013). A single-company focus helps to improve internal validity and keep unsolved variance (error, “noise”) small in the model assessment and hence increases the power of hypotheses testing (Valenzuela et al., 2010).

#### 4.3.2 DEFINING VALUES

Before data extraction from the warehouse, the main task was to identify and define the major values that were relevant in the computation of the CLV values. It was considered that the less relevant values would be excluded from the data. Acronyms and brief descriptions are provided in Table 2.

**TABLE 2: ACRONYMS AND BRIEF DESCRIPTIONS OF VALUES**

ID_Number	Identity number of the customer
Account_Num	Account number of the customer (Anonymised)
Account_Open_Dt	The date an account was opened

Account Age_Band	The account age band
Product_ID	The product identification
Product_Name	The product name
PL_Limit	Personal loan limit amount
Balance_Amt	The balance of the account
Income_Band	The income band
Delinquent_Cycle	Number of months an account in arrears
Operating_Income	Cost of maintaining an account
Customer_Age	The physical age of the customer
Gender	The gender of the customer
Ethnicity_Desc	The ethnical description
Customer_Lang	The language of the customer
Marital_Status	The marital status of the customer
Province	The province were the customer live
Occupation_Level_Desc_1	The job description of the customer
Occupation_Industry_Desc	The industry description of the customer
Occupation_Status_Desc	The job status of the customer
Total_number_products	The total number of products owned by the customer

### 4.3.3 CHALLENGES ENCOUNTERED

Due to the sensitivity of the data, the approval process to get the data was long and tiring. The waiting period until the final approval was close to three months. Out of the 15 fields requested, three of the fields were excluded from the final data. The reason given was that upon completion of this research, the audience might identify the organisation and notify the competitors. In spite of all these challenges, the quality and completeness of the data was above the authors' expectation.

## **4.4 SAMPLE DESIGN**

### **4.4.1 UNIVERSE/POPULATION**

Jacobs and Smit (2010) reasoned that understanding the target audience is valuable in determining the level of complexity of questions. Saunders & Lewis (2012, p.9) defines population as a “complete group of entities sharing some common set of characteristics”. The population for this study is all account holders of a certain bank (name withheld for confidentiality) who belong to a CLV segment in South Africa.

The universe for the research comprised all active Personal Loan account holders between April 2008 and July 2014 of the single bank living in the Republic of South Africa. Excluded from the universe are the account holders whose balance were more than or equal to zero, account holders who have closed their Personal Loan accounts and the account holders who have other bank products beside the Personal Loan in certain geographical areas. The total size of the active Personal Loan population of the single bank was 2,475, 341 of which 357,687 were excluded representing 14.5% of the total.

### **4.4.2 UNIT OF ANALYSIS**

The sampling unit in this study is any active Personal Loan account holder who falls within the designated CLV segments and has yet to pay back the loan to the single bank respectively. In this research there is no difference between the universe or population and the units of analysis.

### **4.4.3 SAMPLING TECHNIQUE**

Probability sampling is defined as a “technique in which every member of the population has a known, non-zero probability of selection” (Steyn, Smith, Du Toit & Strashem, 2000, p.20). In order to eliminate the inherent bias the probability sampling technique called systematic sampling was applied. Saunders & Lewis (2012) define systematic sampling as a type of probability sampling in which the first sample member is selected from the sampling frame at random, using a random number. Remaining sample members are



selected subsequently at regular intervals from the sampling frame. The reason for proposing this sampling method is that it is simple to draw the sample and easy to check (Salkind, 2013).

#### **4.4.4 SAMPLING FRAME**

Saunders & Lewis (2012) defines sample frame as the comprehensive list of all members of the total population. Due to the sensitivity of the data, an unidentified data sample was extracted from the company warehouse from the complete population of all customers with a Personal Loan account.

#### **4.4.5 SAMPLE SIZE**

A total sample of 8,654 was extracted from 2,117,654 Personal Loan accounts of customers using a systematic sampling technique.

### **4.5 RESEARCH INSTRUMENT/MEASUREMENT**

#### **4.5.1 RELIABILITY**

The integrity and accuracy of the data was one of the main focus areas in researching this topic. Kalk, Luik, Taimalu & Täht (2014) defined reliability as the point to which the measures are free from error and as result can yield reliable results. Statistical Analytic Software (SAS) was used extensively during the data extraction from the warehouse. To ensure solid, clean, trustworthy data that can generate meaningful analysis, experienced senior data analysts thoroughly verify data accuracy and consistency by: (i) checking if all variables that are required are available in the warehouse, (ii) removing redundant units and duplication from the data, (iii) checking consistency against the NCA records and (iv) forward to senior manager for final data quality check.

#### **4.5.2 VALIDITY**

Saunders & Lewis (2012) defines validity as the ability of the measuring instrument to accurately measure what it is intended to measure. Hwang et al. (2004) model in this study, precisely measure what it is intended to measure which is the CLV. In order to introduce rigor in this research an expert (statistician) in quantitative analysis was consulted to verify if the Hwang et al. (2004) model was accurately measured.

#### **4.6 DATA ANALYSIS**

Descriptive statistics and inferential statistics were both employed in this research. Saunders & Lewis (2012) list the following three steps when analysing data quantitatively: (i) working out the number of variables and giving them clear names, (ii) working out coding schemes and (iii) coding each variable and leaving out variables with no data (blanks).

##### **4.6.1 DESCRIPTIVE STATISTICS**

The purpose of using descriptive statistics in this study is to get an overview of the data and to convert the data into a form that is more comprehensible to understand (Se-Kang Kim, 2011). Descriptive statistics was also used to get the general depiction of CLV scores against the main variables of the collected data. This descriptive analysis results in the presentations of arithmetic means and frequency table category proportions (%) mode.

##### **4.6.2 INFERENCE ANALYSIS**

As the analysis develops beyond the descriptive stage, inferential analysis (hypothesis testing) is applied. Kamin (2010) defines inferential statistics as the statistical method that use the theory of probability and statistical distributions to deduce characteristics of population against the properties of a sample data drawn from it. Chi-squared distributions were used more in the data analysis. This inferential analysis results in the presentations of correlations, p-value analysis and regression analysis.

### 4.6.3 CHI-SQUARED TEST

The Chi-Square Test for independence will be used to do inferential analysis in this study. The Chi-square statistic is a non-parametric (or distribution free) tool used to determine whether there is a significant association between variables (Steyn et al., 2010). The advantage of using the Chi-Square Test over other non-parametric statistics is that it is easy to calculate and interpret and it is malleable in handling data from several group studies (Salkind, 2013).

The complications of using Chi-squared distributions are the interpretation if the outcome is a Type I and Type II error. Steyn et al. (2010) describe **Type I error (false positive)** as a correct null hypothesis is rejected whilst **Type II (false negative)** error as an incorrect null hypothesis accepted.

#### Steps when using the Chi-square test

The steps to be followed when using the Chi-square test are explained by Salkind (2013, p.326-329).

Step 1: Define the null and the alternative hypothesis.

Step 2: Select the level of risk.

Step 3: Select the appropriate test statistic.

Step 4: Calculate the test statistic of the data.

Step 5: Decide whether or not to reject the null hypothesis.

**P-Value** is calculated using Microsoft Excel 2010 CHIDIST formula indicated below

***CHIDIST (X, Deg\_freedom)***

Where: **X** is the test statistics C in Table 3 and ***Deg\_freedom*** is *sample size - 1*

Table 3 summaries the tools applicable for the Chi-square test for independence.

**TABLE 3: TOOLS APPLICABLE FOR THE CHI-SQUARE TEST FOR INDEPENDENCE**

<b>Test Statistics</b>	<b>Distribution of test statistic under <math>H_0</math></b>	<b>Table with critical values</b>
$C = \sum_{i=1}^I \sum_{j=1}^J \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$ <p>With <math>E_{ij} = \frac{R_i K_j}{n}</math></p>	Approximately $X^2_{\{(I-1)(J-1)\}}$ if $n$ is large and $E_{ij} \geq 5$	Table in Appendix A
<b>Hypothesis</b>	<b>Decision Rule:</b> <b>Reject <math>H_0</math> if</b>	<b><math>p</math> – value</b>
$H_0$ : Row and Column factors independent  $H_1$ : Row and column factors dependent	$c \geq X^2_{(I-1)(J-1), \alpha}$	$p = P(C \geq c)$

Source: Steyn, A.W.G., Smit, C.F., Strasheim, C. & Du Toit, S.H.C. (2000). Modern statistics in practice.

Table 5 and Table 6 illustrate the observed values and expected values respectively. Observed values are the actual values derived from the data sample. Expected values are calculated by multiplying the totals of the corresponding rows and columns in the observed value table. An example of how the expected table values (e values) are calculated is shown below – refer to the first cell of Table 5.

$$e_{11} = \frac{r_1 * k_1}{n}$$

$$= \frac{(2,597 * 3,163)}{8,654}$$

$$= 949$$

## **4.7 ETHICAL CONSIDERATIONS**

Research ethics has been numerously defined by different authors. Kalichman (2009, p.86) define research ethics as the “fostering of research that protects the interests of the public, the subjects of research, and the researchers themselves”. Saunders, Lewis & Thornhill (2009, p.184) argues that research ethics relays to “questions about how we formulate and clarify our research topic, design our research and gain access, collect data, process and store our data, analyse data and write up our research findings in a moral and responsible way”.

### **4.7.1 ETHICAL CLEARANCE**

The research application for ethical clearance was approved by the ethical committee of the Department of marketing and consumer behaviour at the University of Pretoria in July 2014. The application contents included the following:

- (a) Methodology section of the research proposal
- (b) Permission letter from organisation to use the data
- (c) Consent procedures to ensure confidentiality and anonymity on all the organisation specifics and the data stored without identifiers.

The data collection from the organisation only started after the application of ethical clearance was approved by the ethical committee.

Chapter five will present the results derived from the method discussed in this chapter.

## 5. RESULTS

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This chapter discusses the results of this research. The first part of the chapter is devoted to Personal Loan sample profile. The second part addresses each proposition stated in Chapter Three by using presentation of descriptive and inferential results. The results are reconnoitred and explained with reference to the research propositions. The last part of this chapter is devoted to conclusions which will be mostly the findings from using descriptive and inferential analysis. This chapter aims to address the following research propositions:

**TABLE 4: RESEARCH PROPOSITIONS ADDRESSED IN THIS CHAPTER**

Proposition 1	Low CLV customers are more likely to end up over-indebted than high CLV customers?
Proposition 2	Young age group customers are more likely to end up over-indebted than old age group customers?
Proposition 3	Male customers are more likely to end up over-indebted than female customers?

### 5.1 SAMPLE PROFILE

A total population of 2,117,654 Personal Loan customers' accounts were systematic sampled using SAS from the warehouse. The total sample of 8,654 was attained upon which the research is instituted. The integrity and accuracy of the data was thoroughly checked to ensure solid, clean, trustworthy data that can generate meaningful analysis. The sample produced information describing the demographic profile of the customers in this research.

## 5.2 RESEARCH PROPOSITION ONE

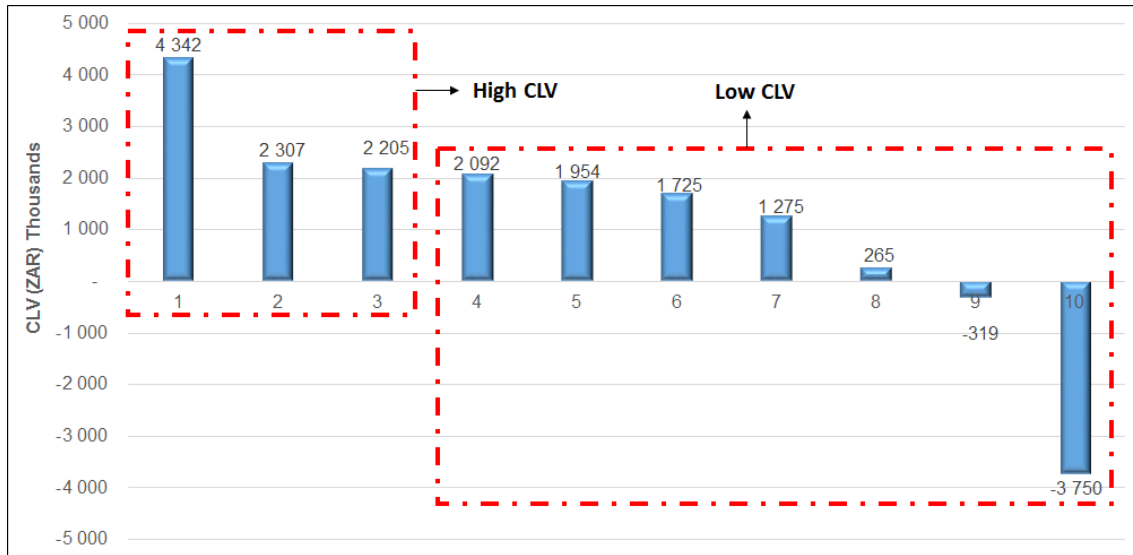
**Low CLV customers are more likely to end up over-indebted than high CLV customers?**

### 5.2.1 DESCRIPTIVE ANALYSIS

The next descriptive results discourse the research proposition in its straightforward form. Few references have been applied in this section. In order to ascertain if one variable influence another, relationship among two variables will be tested.

To address this proposition, the segmentation of the data into high and low CLV was done first in order identify customers according to their CLV scores. The Personal Loan customer data based on CLV scores was equally divided in ten deciles. Deciles are values of a variable, which divides its distribution into ten parts with equal frequencies (Se-Kang Kim, 2011). Figure 6 indicate that a significant of 73% of the total Personal Loan value is derived from the top 30% of high CLV customers. The bottom 70% of low CLV customers contributes only 27% of the total Personal Loan value. This implies that high CLV customers accounted more profits to the company on Personal Loan than low CLV customers. But perhaps if the addition of medium CLV to the bottom 70% customers was done, the Personal Loan profit distribution would have changed significantly in such a way that high CLV will still lead with 73%, medium CLV second with 48% and low CLV with a negligible negative 21%.

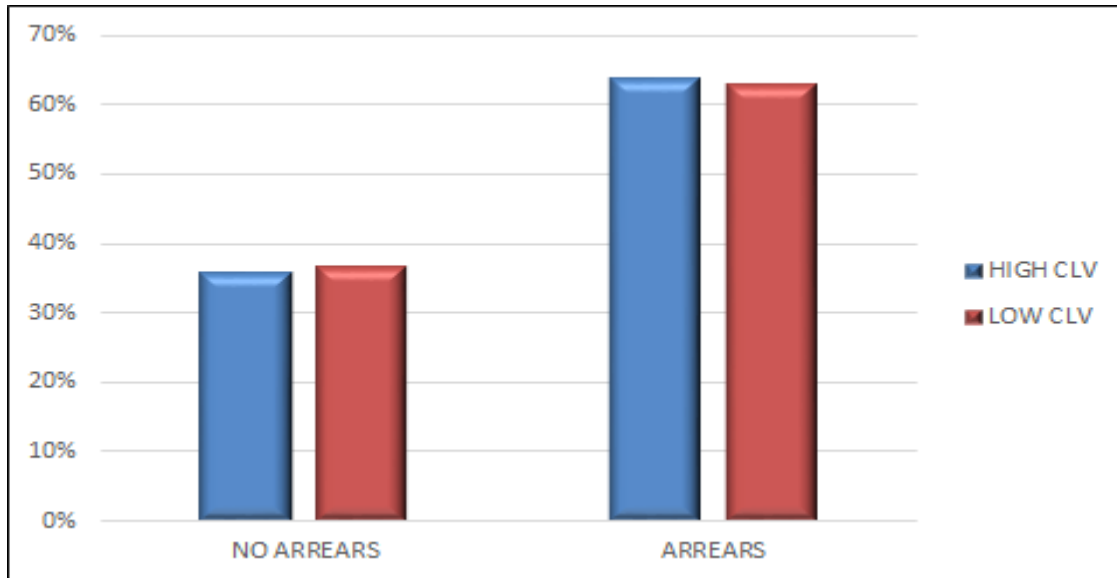
**FIGURE 6: PERSONAL LOAN CUSTOMER SEGMENTATION BASED ON CLV SCORES**



The Figure 7 below illustrates the distribution of Personal Loan arrears in both high CLV and low CLV customers. A closer examination indicates that 36% of the high CLV customers have no arrears in comparison to 37% of the low CLV customers. 64% of high CLV customers are in arrears in comparison to 63% of the low CLV customers. This suggests that the customers with or without arrears are relatively evenly spread with a slightly skewed arrears towards high CLV. This might also suggest that the low CLV customers are relatively less over-indebted than high CLV customers.



**FIGURE 7: PERSONAL LOAN CUSTOMER ARREARS BY CLV SEGMENTATION**



### 5.2.2 INFERENCE ANALYSIS

Table 5 and table 6 below shows the observed values and expected values of customer arrears segmented by the customer CLV. Expected values are derived from the formula shown in section 4.6.3

Applying the Chi-square test steps shown in section 4.6.3

#### **Step 1 - Hypothesis**

$H_0$ : Low CLV customers and over-indebtedness are independent.

$H_1$ : Low CLV customers and over-indebtedness are associated.

#### **Step 2 – Select the level of risk and determine the test parameters**

$\alpha = 0.01$  (1% level of significance) was chosen. Since  $(I - 1)(J - 1) = (2 - 1)(2 - 1) = 1$ , it follows that under  $H_0$

$$C = \sum_{i=1}^I \sum_{j=1}^J \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

is approximately distributed according to the  $X^2(1)$

**Step 3 – Determine the critical value**

Using Chi-Square Table in Appendix A,  $X^2_{1,0.01} = 6.635$  Such that  $H_0$  is rejected if  $c \geq 6.635$

**Step 4 – Using Table 5 and Table 6, the test statistic will be.**

$$c = \frac{(933 - 949)^2}{949} + \dots + \frac{(3,827 - 3,843)^2}{3,843} \approx 0.62$$

**Step 5 – Compare the test statistic with the critical value**

Since  $c \leq 6.635$ , it follows that  $H_0$  is not rejected at 1% level of significance. It is therefore concluded that the low CLV customer and over-indebtedness are independent.

**P-Value** using Microsoft Excel 2010 CHIDIST formula is 0.4303. This means that it is large enough (greater than  $\alpha = 0.01$ ) not to reject the null hypothesis that the low CLV customer and over-indebtedness are independent.

**TABLE 5: OBSERVED VALUES FOR PERSONAL LOAN ARREARS BY CLV SEGMENTATION**

CUSTOMER CLV	ARREAR STATUS		TOTAL
	NO ARREARS	ARREARS	
HIGH CLV	933	1,664	2,597
LOW CLV	2,230	3,827	6,057
TOTAL	3,163	5,491	8,654

**TABLE 6: EXPECTED VALUES FOR PERSONAL LOAN ARREARS BY CLV SEGMENTATION**

CUSTOMER CLV		ARREAR STATUS		TOTAL
		NO ARREARS	ARREARS	
	<b>HIGH CLV</b>	949	1,648	2,597
	<b>LOW CLV</b>	2,214	3,843	6,057
	<b>TOTAL</b>	3,163	5,491	8,654

### 5.3 RESEARCH PROPOSITION TWO

**Young age group customers are more likely to end up over-indebted than old age group customers?**

#### 5.3.1 DESCRIPTIVE ANALYSIS

Table 7 indicates that the age of the Personal Loan customers varies from 20 years to 50 years and above. The majority of 3,884 (45%) being 35 years old to 49 years old. 131 (2%) customers were less than 24 years and 2,388 (27%) were between 25 and 34 years old whilst 2,251(26%) were above 50 years. This suggests that the proportion of young age group customers below 35 years with Personal Loan (29%) are significantly less than older age group customers above 35 years (71%).

**TABLE 7: DISTRIBUTION OF PERSONAL LOAN BY CUSTOMER AGE GROUPS**

Group	Frequency*	Percentage
20 years to 24 years	131	2
25 years to 34 years	2,388	27
35 years to 49 years	3,884	45
50 years and older	2,251	26
<b>Total</b>	<b>8,654</b>	<b>100</b>

Figure 8 show that the proportion of old age groups in both high CLV customers and low CLV customers outweighs the young age groups. This insight negates Kumar & Rajan (2009) findings that low CLV is dominated by young age groups.

**FIGURE 8: PERSONAL LOAN CUSTOMER AGE GROUP PROPORTION BY CLV SEGMENTATION**

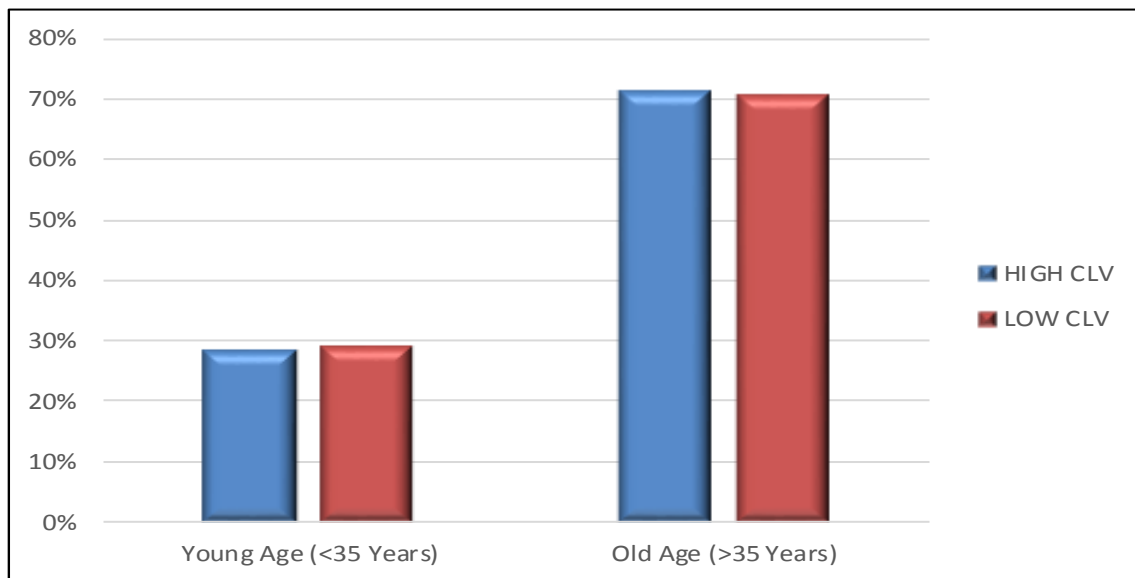
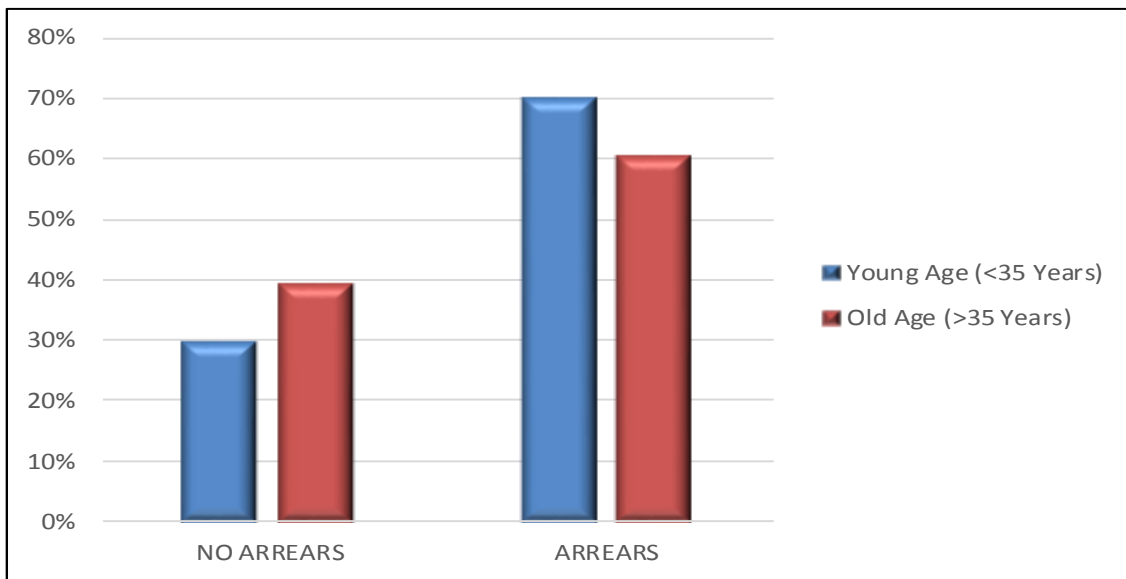


Figure 9 indicates that 30% of young age group are without arrears in comparison to 39% in the old age group. Proportion of young age group in arrears is 70% higher than 61% in the older age group. These insights relatively supports the research proposition in section 3.2 that says that young age group customers are more likely to end up over-indebted than old age group customers.

**FIGURE 9: PERSONAL LOAN ARREARS BY CUSTOMER AGE GROUPS**



### 5.3.2 INFERENCE ANALYSIS

Table 8 and table 9 below shows the observed values and expected values of customer arrears segmented by the customer age groups. Expected values are derived from the formula shown in section 4.6.3

Applying the Chi-square test steps shown in section 4.6.3

#### Step 1 - Hypothesis

$H_0$ : Young age group customers and over-indebtedness are independent.

$H_1$ : Young age group customers and over-indebtedness are associated.

**Step 2 – Select the level of risk and determine the test parameters**

$\alpha = 0.01$  (1% level of significance) was chosen. Since  $(I - 1)(J - 1) = (2 - 1)(2 - 1) = 1$ , it follows that under  $H_0$

$$C = \sum_{i=1}^I \sum_{j=1}^J \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

is approximately distributed according to the  $X^2(1)$

**Step 3 – Determine the critical value**

Using Chi-Square Table in Appendix A,  $X^2_{1,0.01} = 6.635$  Such that  $H_0$  is rejected if  $c \geq 6.635$

**Step 4 – Using Table 8 and Table 9, the test statistic will be.**

$$c = \frac{(749 - 921)^2}{921} + \dots + \frac{(3,721 - 3,893)^2}{3,893} \approx 71.17$$

**Step 5 – Compare the test statistic with the critical value**

Since  $c \geq 6.635$ , it follows that  $H_0$  is rejected at 1% level of significance. It is therefore concluded that the young age group customers and over-indebtedness are associated.

**P-Value** using Microsoft Excel 2010 CHIDIST formula is 0.0032. This means P-value is very small (less than  $\alpha = 0.01$ ) such that the null hypothesis is rejected and therefore young age group customers and over-indebtedness are associated.

**TABLE 8: OBSERVED VALUES OF PERSONAL LOAN ARREARS BY CUSTOMER AGE GROUPS**

CUSTOMER AGE GROUPS		ARREAR STATUS		TOTAL
		NO ARREARS	ARREARS	
	YOUNG AGE (<35 Years)	749	1,770	2,519
	OLD AGE (>35 Years)	2,414	3,721	6,135
	<b>TOTAL</b>	3,163	5,491	8,654

**TABLE 9: EXPECTED VALUES OF PERSONAL LOAN ARREARS BY CUSTOMER AGE GROUPS**

CUSTOMER AGE GROUPS		ARREAR STATUS		TOTAL
		NO ARREARS	ARREARS	
	YOUNG AGE (<35 Years)	921	1,598	2,519
	OLD AGE (>35 Years)	2,242	3,893	6,135
	<b>TOTAL</b>	3,163	5,491	8,654

#### 5.4 RESEARCH PROPOSITION THREE

**Male customers are more likely to end up over-indebted than female customers?**

##### 5.4.1 DESCRIPTIVE ANALYSIS

Figure 10 indicates that CLV scores of both male and female follows a Pareto principle discussed in section 3.1. 59% of Personal Loans high CLV customers are males', whilst females only 41% of high CLV customers. In the low CLV segment, males' also dominate with 64% representation in comparison to females 36%. This suggests that males outweigh females in both high and low CLV segmentation. Probably this is due to the high proportion of males with Personal Loan (63%) in comparison to females (37%). High proportion of males in low CLV supports Kumar & Rajan (2009) findings that low CLV is dominated by males in comparison to females.

**FIGURE 10: PERSONAL LOAN CUSTOMER GENDER PROPORTION BY CLV SEGMENTATION**

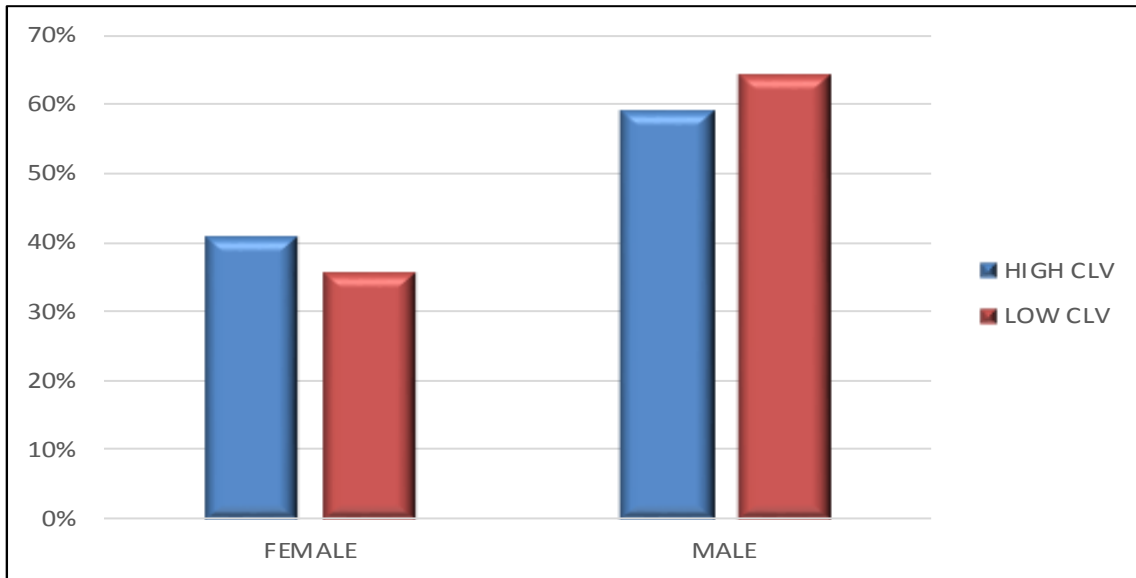
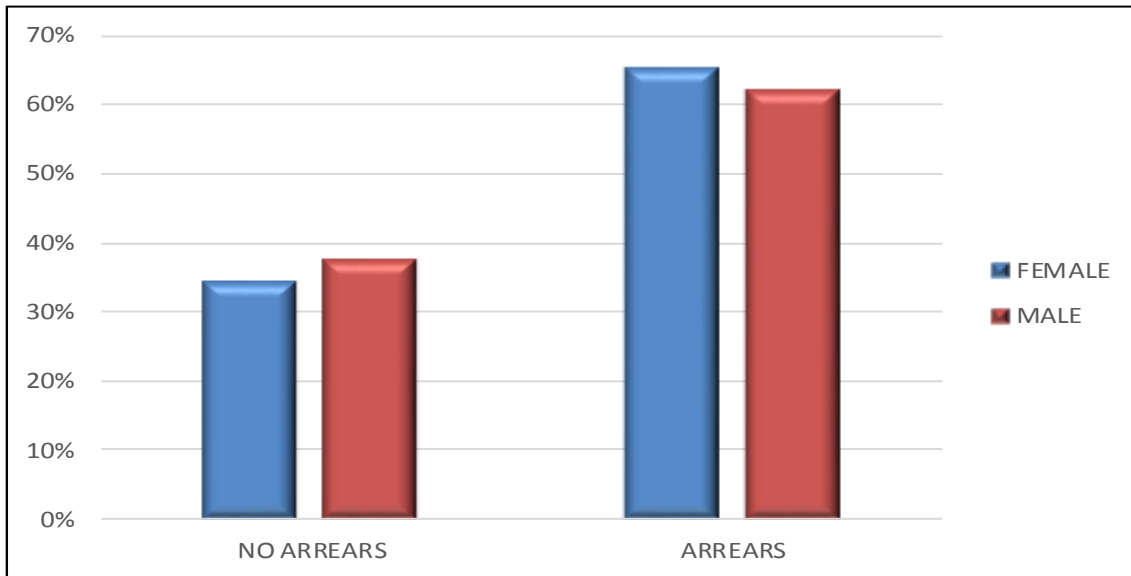


Figure 11 show that 38% of the males have no Personal Loan arrears compared to 35% of the females. 65% of females have Personal Loan arrears in comparison to 61% of the males. This suggests that the customers with or without arrears are relatively evenly spread with a slightly skewed arrears towards females. This implies that the females are slightly over-indebted than males negating the research proposition in section 3.3.



**FIGURE 11: PERSONAL LOAN ARREARS BY CUSTOMER GENDER**



#### **5.4.2 INFERENCE ANALYSIS**

Table 10 and table 11 below shows the observed values and expected values of customer arrears segmented by the customer age groups. Expected values are derived from the formula shown in section 4.6.3

Applying the Chi-square test steps shown in section 4.6.3

##### **Step 1 - Hypothesis**

$H_0$ : Male customers and over-indebtedness are independent.

$H_1$ : Male customers and over-indebtedness are associated.

##### **Step 2 – Select the level of risk and determine the test parameters**

$\alpha = 0.01$  (1% level of significance) was chosen. Since  $(I - 1)(J - 1) = (2 - 1)(2 - 1) = 1$ , it follows that under  $H_0$

$$C = \sum_{i=1}^I \sum_{j=1}^J \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

is approximately distributed according to the  $X^2(1)$

**Step 3 – Determine the critical value**

Using Chi-Square Table in Appendix A,  $X^2_{1,0.01} = 6.635$  Such that  $H_0$  is rejected if  $c \geq 6.635$

**Step 4 – Using Table 10 and Table 11, the test statistic will be**

$$c = \frac{(1,113 - 1,177)^2}{1,177} + \dots + \frac{(3,384 - 3,448)^2}{3,448} \approx 8.71$$

**Step 5 – Compare the test statistic with the critical value**

Since  $c \geq 6.635$ , it follows that  $H_0$  is rejected at 1% level of significance. It is therefore concluded that the male customers and over-indebtedness are associated.

**P-Value** using Microsoft Excel 2010 CHIDIST formula is 0.0000000000000003. This means P-value is very small (less than  $\alpha = 0.01$ ) such that the null hypothesis is rejected and therefore male customers and over-indebtedness are associated.

**TABLE 10: OBSERVED VALUES FOR PERSONAL LOAN ARREARS BY CUSTOMER GENDER**

CUSTOMER GENDER	ARREAR STATUS		TOTAL
	NO ARREARS	ARREARS	
FEMALES	1,113	2,107	3,220
MALES	2,050	3,384	5,434
TOTAL	3,163	5,491	8,654

**TABLE 11: EXPECTED VALUES FOR PERSONAL LOAN ARREARS BY CUSTOMER GENDER**

<b>CUSTOMER GENDER</b>		<b>ARREAR STATUS</b>		<b>TOTAL</b>
		<b>NO ARREARS</b>	<b>ARREARS</b>	
	<b>FEMALES</b>	1,177	2,043	3,220
	<b>MALES</b>	1,986	3,448	5,434
	<b>TOTAL</b>	3,163	5,491	8,654

## **5.5 CONCLUSIONS**

This chapter presented the results of the study. Three propositions highlighted in Chapter Three of the study were robustly tested using both descriptive and inferential analysis. Frequency tables and graphs were used in this chapter to get an overview of the data. Chi-squared test was used for inferential analysis to deduce characteristics of population against the properties of a sample data drawn from it. It was found that low CLV customers are actually not over-indebted in comparison to high CLV customers as previously proposed. Young age group customers were found to be over-indebted than old age group customers. Male customers were found to be over-indebted than female customers. The next chapter presents the interpretation of the results.

## **6. RESULTS DISCUSSION**

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### **6.1 INTRODUCTION**

This chapter discusses the findings from the study results provided in Chapter Five. The chapter answers propositions in Chapter Three using literature review of Chapter Two to support in results explanation. The chapter begins with the overview of the current study and a brief summary of the findings. The second part discusses interpretation of the results according to the research topic as well as the three research propositions. The chapter concludes with a conclusion.

### **6.2 OVERVIEW OF THE STUDY**

The current study sought to better understand the existence of a relationship between customer lifetime value and over-indebtedness of customers in the banking environment. The purposes of the investigations in this study were specifically focussed on answering the following research propositions:

- (1) Low CLV customers are more likely to end up over-indebted than high CLV customers?
- (2) Young age group customers are more likely to end up over-indebted than old age group customers?
- (3) Male customers are more likely to end up over-indebted than female customers?

The secondary data from one of the South African “big four” banks was used. The data was extracted from the company warehouse using systematic sampling technique. The sample consisted of 8,654 customers with a Personal Loan. Hwang model mentioned in section 2.2.4 was applied to the sample data so as to get the customer valuation scores. The advantage of using Hwang model than other customer valuation models is that it takes into account both past profit contribution and the predicted value of the customers. The sample of 8,654 customers was segmented into high CLV and low CLV according to

the CLV scores obtained after using Hwang model. High CLV were denoted as profitable customers and low CLV as less profitable customers to the company.

A descriptive analysis was used to get an overview of the data and to get the general depiction of CLV scores against the main variables of the collected data. An inferential analysis was used to deduce characteristics of population against the properties of a sample data drawn from it. Under inferential analysis, nonparametric Chi-squared test tool was used in this study to determine whether there is a significant association between variables. The advantage of using the Chi-Square Test is that it is easy to calculate and interpret.

The primary study findings can be abridged below:

- High CLV customers were found to be over-indebted than low CLV customers.
- Young age group customers were found to be over-indebted than old age group customers
- Male customers were found to be over-indebted than female customers.

### **6.3 EXPLANATION OF RESULTS**

This section discusses results of the study. The low CLV variable that was found not related to over-indebtedness is discussed. This is followed by discussion of young age group and male variables that were found to be related to over-indebtedness.

#### **6.3.1 RESEARCH PROPOSITION ONE**

**Low CLV customers are more likely to end up over-indebted than high CLV customers?**

It is evident from the descriptive analysed data that distribution of high CLV and low CLV customers are relatively evenly spread when it comes to proportion of over-indebtedness. Even though the total Personal Loan proportion of low CLV customers (70%) was more than double of high CLV customers (30%), it was still expected that the high CLV customers' arrears will be significantly less than low CLV customers. However, with 64% of high CLV and 63% of the low CLV Personal Loan customers in arrears (indebted), this might suggest that there is no significant difference between these two segments.

One of the main aims of the current study was to determine if there is a relationship between low CLV customers and over-indebtedness. Chi-squared statistical test was used to arrive at these results as delineated in section 5.2.2. It was hypothesised that low CLV customers and over-indebtedness are associated. The results contradict the hypothesis that low CLV customers and over-indebtedness are independent of each other. This implies that customers who are segmented by companies as low CLV are not inevitably over-indebted.

### **6.3.2 RESEARCH PROPOSITION TWO**

**Young age group customers are more likely to end up over-indebted than old age group customers?**

It was hypothesised in section 5.3.2 that young age group customers are more likely to end up over-indebted than old age group. The results confirm the hypothesis that young age group customers and over-indebtedness are associated. With regards to young age group, the results from the current study were also similar to those of previous research (Gathergood 2012, Holm, Kumar & Rohde 2012; Kumar & Rajan 2009). This finding of the current study therefore suggest that young age groups cannot afford to continue servicing their debt after all other necessary expenditures have been paid, whereas old age groups are less likely to be over-indebted. The possible reason why young age groups suffer from

financial distress is that they are highly materialistic due the aspirational needs to fit the ideal lifestyle resulting in spending more money and spending more time on shopping (Jacobs & Smit, 2010). It is evident from data secured that 90% of the old age groups are married and have children. Schicks (2014) argued that having more children reduces risk of over-indebtedness because children encourage parents to be financial disciplined.

### **6.3.3 RESEARCH PROPOSITION THREE**

**Male customers are more likely to end up over-indebted than female customers?**

Although very little research has focussed on the connection between over-indebtedness and gender, it has been suggested by Lusardi & Tufano (2009) findings that men do not seek financial advice than women and as a result are at high risk of being over-indebted. In the current study in section 5.4.2 it was hypothesised that male customers are more likely to end up over-indebted than female customers. The results confirm the hypothesis that male customers and over-indebtedness are associated. This finding of the current study therefore suggests that male customers are more likely to get caught in the debt trap than females. However Raijas et al. (2010) findings argued that due to the changing culture in the society, employment levels among females are now high such that they are also getting stuck in the debt cycle.

## **6.4 CONCLUSIONS**

Chapter six has discussed the findings of the current study, showing that low CLV customers are not as over-indebted in comparison to high CLV as per research proposition one in chapter three. This chapter has also confirmed the findings as per proposition two and three that young age group and male variables are related to over-indebtedness.

A detailed discussion and explanation of these findings now follows in the next section.

## **7. CONCLUSIONS**

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### **7.1 INTRODUCTION**

The purpose of this research was to understand if there is a relation between customer lifetime value and over-indebtedness. Since this field is still new and underdeveloped, the literature on CLV models is still patchy. This chapter discusses recommendations on the basis of the three research propositions, suggestions for the future research and research limitations. The chapter concludes with a conclusion where the critical evaluation of the overall study is discussed.

### **7.2 CONCLUSIONS DRAWN FROM LITERATURE REVIEW**

The literature review revealed the confusion that most researchers might feel about choosing the best CLV model and how you can apply it in testing variables such as over-indebtedness of customers. As mentioned in the literature review, there were rather less coherent studies that have to the best of the authors' knowledge considered the relationship between CLV and over-indebtedness specifically in banking consumers. This study has partially covered the gap. However there is still room for future research to fully conceal this area.

The findings of this study have challenged the perceptions brought to the fore by academics such as (Holm, Kumar & Rohde 2012; Kumar & Rajan 2009) that high CLV customers are more valuable and profitable to the respectable companies than low CLV customers. They profiled low CLV as unprofitable customers dominated by young age group who are mainly males. The insights from the descriptive analyses of this study have proved shows that old age groups rather than young age groups dominate in the low CLV segment. In contrary, the insights from the descriptive analyses of this study agree with Kumar & Rajan (2009) findings that males still significantly dominate low CLV segment than females.



This study findings that low CLV customers are less likely to end up over-indebted as high CLV is partially in agreement with Prahalad (2002) findings in BOP. Low CLV customers resembles low income earners Prahalad (2002) BOP theory. Prahalad (2002) argued that low income earners bring exceptional opportunities to companies as they are viewed as potential consumers. In addition Prahalad (2002) warned against companies that have a negative perception mind-set towards the poor at the bottom of the socio-economic pyramid risk losing their market share in the long run.

### **7.3 RECOMMENDATIONS**

Based on the findings and conclusions drawn from the current study, several recommendations can be made. Each research proposition is addressed through posing a series of recommendation for further research. Giving recommendations according to each proposition allows the research topic to be thoroughly answered from end to end.

#### **7.3.1 RESEARCH PROPOSITION ONE**

**Low CLV customers are more likely to end up over-indebted than high CLV customers?**

- In light of the current study's findings that low CLV customers are not inevitably over-indebted, it is recommended that companies should desist favouritism towards high CLV customers who they reckoned to be profitable. Since companies lack rigorous management strategies on how to manage favouritism, they end up losing customers they previously segmented as non-profitable (low CLV) with future potential of being profitable customers to their competitors.
- Financial institutions need to be approached and the findings of this research discussed with respect to how they can groom low CLV customers into high CLV customers as they have a future potential of being profitable. It is apparent that

most financial institutions are impatient with the low CLV customers who are profitable in the long-term because they focus too much on the short-term profitability that high CLV brings.

- Since a single bank operating in South Africa was examined in this research study. It is recommended that future research should focus on understanding high CLV customers, low CLV customers and over-indebtedness in other banks in South Africa and compare the findings with banks from abroad.
- The current study was limited only to the customers and the lending product of one bank. It is recommended that future research should focus also on customers and products from other banks in South Africa.

### 7.3.2 RESEARCH PROPOSITION TWO

**Young age group customers are more likely to end up over-indebted than old age group customers?**

- The study findings correctly confirmed that young age group are more likely to be over-indebted than old age group, however it failed to consider that after the 2008 financial crisis young people are shedding debt faster than old people. Young people have avoided getting caught in debt cycle through either delaying marriage or delaying owning a mortgage by sharing rent with housemates (Larson, 2013). It is recommended that future research should focus on the proportion of young households who have hold on to debt against the young households who managed to shed debt with respect to the company CLV scores.

### 7.3.3 RESEARCH PROPOSITION THREE

**Male customers are more likely to end up over-indebted than female customers?**

- The current study failed to consider the changing culture in the society where employment of women has increased to such an extent that they are also getting caught in the debt cycle. For this reason, it is recommended that future research take into consideration high proportion of women employment when researching an association of gender and over-indebtedness.

### 7.4 RESEARCH LIMITATIONS

The deficiencies in any research can occur due to the author choosing incorrect research design, universe, sampling technique or sampling size. The author has put maximum effort on research data by consulting with several experienced statisticians to ensure that reliability and validity of the data is above reproach. However, in any research there is always room for improvement. The following were the authors' key hurdles to this research:

- (a) The chosen quantitative research design drawback as argued by Saunders & Lewis (2012) is that it is as good as the sample from which it is drawn and it cannot make inferences beyond the limitations of the sample and research design. In addition Se-Kang Kim (2011) observed the inability of quantitative research design in detecting changes over time becoming a one snapshot situation as another potential drawback.
- (b) The potential danger of using systematic probability sampling technique is the "phenomenon of lurking periods" that is when the sampling ratio does not

correspond with the length of possible period in the population (Steyn et al., 2010, p.7)

- (c) Only a single bank operating in South Africa is examined in this research study. Further research should focus on understanding CLV and over-indebtedness in other banks in South Africa and even abroad.
- (d) The research study is also limited to the banking customers of this single bank. As a result the customers who bank outside South Africa will not be considered.
- (e) The research study is limited to one lending bank product. Further research should focus on understanding CLV and over-indebtedness in other bank products in South Africa.
- (f) A proxy of churn rate is assumed to be 24%, derived by NCA (2012)
- (g) Over-indebted has been strictly defined in this study as any person whose Personal Loan account is in arrears for at least one month.
- (h) In this study, young age group denotes the customers between 20 years and 34 years, whilst older age groups are customers above 35 years

## **7.5 CONCLUSIONS**

This dissertation comprised of seven chapters. The first chapter presented a summarised overview of the current study and the importance of doing such a study. The second chapter discussed different academic literatures pertaining to CLV and over-indebtedness, and introduced Hwang model used in the present study. The third chapter presented a discussion on the three propositions for the current study. Chapter four and chapter five presented the methodology used and the results of the study respectively. Chapter six presented a discussion on the study findings and Chapter seven talked about the recommendations for the future researches and the current study limitations.

The main findings of the current study showed that low CLV customers and over-indebtedness are not associated. This is a negation of the previous findings by academics such as (Holm, Kumar & Rohde 2012; Kumar & Rajan 2009). The findings of the study reminds companies to limit profiling low CLV customers as over-indebted and stop discriminating them from financial benefits offered to high CLV customers. Prahalad (2002)

warned companies against such a negative perception mind-set towards the poor (low CLV) at the BOP that they risk losing their market share in the long run. Prahalad (2002) argued that the poor (low CLV) bring exceptional opportunities to companies as they are viewed as potential consumers.

Even though it was found that variables such as young age groups and males are significantly associated with over-indebtedness, there is some indication that young people are shedding debt faster than old people (Larson, 2013) and females are increasingly getting caught in debt cycle (Raijas et al.,2010). It can therefore be anticipated that as time progresses due to the changing of culture in the society, variables such as young age groups and males will cease to be associated with over-indebtedness.

Finally, the research in this field is of key importance even though the empirical data is still limited in the CLV and over-indebtedness domain. We consider that substantial research is still necessary to reach any confident inference about the relationship of CLV and over-indebtedness.

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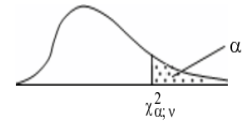
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# APPENDIX A

**Table of the Chi-square Distribution**



$\alpha =$	0.995	0.99	0.98	0.975	0.95	0.90	0.80	0.20	0.10	0.05	0.025	0.02	0.01	0.005	0.001	$=\alpha$
V = 1	0.0000393	0.000157	0.000628	0.000982	0.00393	0.0158	0.0642	1.642	2.706	3.841	5.024	5.412	6.635	7.879	10.827	V = 1
2	0.0100	0.0201	0.0404	0.0506	0.103	0.211	0.446	3.219	4.605	5.991	7.378	7.824	9.210	10.597	13.815	2
3	0.0717	0.115	0.185	0.216	0.352	0.584	1.005	4.642	6.251	7.815	9.348	9.837	11.345	12.838	16.268	3
4	0.207	0.297	0.429	0.484	0.711	1.064	1.649	5.989	7.779	9.488	11.143	11.668	13.277	14.860	18.465	4
5	0.412	0.554	0.752	0.831	1.145	1.610	2.343	7.289	9.236	11.070	12.832	13.388	15.086	16.750	20.517	5
6	0.676	0.872	1.134	1.237	1.635	2.204	3.070	8.558	10.645	12.592	14.449	15.033	16.812	18.548	22.457	6
7	0.989	1.239	1.564	1.690	2.167	2.833	3.822	9.803	12.017	14.067	16.013	16.622	18.475	20.278	24.322	7
8	1.344	1.646	2.032	2.180	2.733	3.490	4.594	11.030	13.362	15.507	17.535	18.168	20.090	21.955	26.125	8
9	1.735	2.088	2.532	2.700	3.325	4.168	5.380	12.242	14.684	16.919	19.023	19.679	21.666	23.589	27.877	9
10	2.156	2.558	3.059	3.247	3.940	4.865	6.179	13.442	15.987	18.307	20.483	21.161	23.209	25.188	29.588	10
11	2.603	3.053	3.609	3.816	4.575	5.578	6.989	14.631	17.275	19.675	21.920	22.618	24.725	26.757	31.264	11
12	3.074	3.571	4.178	4.404	5.226	6.304	7.807	15.812	18.549	21.026	23.337	24.054	26.217	28.300	32.909	12
13	3.565	4.107	4.765	5.009	5.892	7.042	8.634	16.985	19.812	22.362	24.736	25.472	27.688	29.819	34.528	13
14	4.075	4.660	5.368	5.629	6.571	7.790	9.467	18.151	21.064	23.685	26.119	26.873	29.141	31.319	36.123	14
15	4.601	5.229	5.985	6.262	7.261	8.547	10.307	19.311	22.307	24.996	27.488	28.259	30.578	32.801	37.697	15
16	5.142	5.812	6.614	6.908	7.962	9.312	11.152	20.465	23.542	26.296	28.845	29.633	32.000	34.267	39.252	16
17	5.697	6.408	7.255	7.564	8.672	10.085	12.002	21.615	24.769	27.587	30.191	30.995	33.409	35.718	40.790	17
18	6.265	7.015	7.906	8.231	9.390	10.865	12.857	22.760	25.989	28.869	31.526	32.346	34.805	37.156	42.312	18
19	6.844	7.633	8.567	8.907	10.117	11.651	13.716	23.900	27.204	30.144	32.852	33.687	36.191	38.582	43.820	19
20	7.434	8.260	9.237	9.591	10.851	12.443	14.578	25.038	28.412	31.410	34.170	35.020	37.566	39.997	45.315	20
21	8.034	8.897	9.915	10.283	11.591	13.240	15.445	26.171	29.615	32.671	35.479	36.343	38.932	41.401	46.797	21
22	8.643	9.542	10.600	10.982	12.338	14.041	16.314	27.301	30.813	33.924	36.781	37.659	40.289	42.796	48.268	22
23	9.260	10.196	11.293	11.688	13.091	14.848	17.187	28.429	32.007	35.172	38.076	38.968	41.638	44.181	49.728	23
24	9.886	10.856	11.992	12.401	13.848	15.659	18.062	29.553	33.196	36.415	39.364	40.270	42.980	45.558	51.179	24
25	10.520	11.524	12.697	13.120	14.611	16.473	18.940	30.675	34.382	37.652	40.646	41.566	44.314	46.928	52.620	25
26	11.160	12.198	13.409	13.844	15.379	17.292	19.820	31.795	35.563	38.885	41.923	42.856	45.642	48.290	54.052	26
27	11.808	12.879	14.125	14.573	16.151	18.114	20.703	32.912	36.741	40.113	43.194	44.140	46.963	49.645	55.476	27
28	12.461	13.565	14.847	15.308	16.928	18.939	21.588	34.027	37.916	41.337	44.461	45.419	48.278	50.993	56.893	28
29	13.121	14.256	15.574	16.047	17.708	19.768	22.475	35.139	39.087	42.557	45.722	46.693	49.588	52.336	58.302	29
30	13.787	14.953	16.306	16.791	18.493	20.599	23.364	36.250	40.256	43.773	46.979	47.962	50.892	53.672	59.703	30
40	20.706	22.164	23.838	24.433	26.509	29.051	32.345	47.269	51.805	55.759	59.342	60.436	63.691	66.766	73.402	40
50	27.991	29.707	31.664	32.357	34.764	37.689	41.449	58.164	63.167	67.505	71.420	72.613	76.154	79.490	86.661	50
60	35.535	37.485	39.699	40.482	43.188	46.459	50.641	68.972	74.397	79.082	83.298	84.580	88.379	91.952	99.607	60
70	43.275	45.442	47.893	48.758	51.739	55.329	59.898	79.715	85.527	90.531	95.023	96.388	100.425	104.215	112.317	70
80	51.171	53.539	56.213	57.153	60.391	64.278	69.207	90.405	96.578	101.880	106.629	108.069	112.329	116.321	124.839	80
90	59.196	61.754	64.634	65.646	69.126	73.291	78.558	101.054	107.565	113.145	118.136	119.648	124.116	128.299	137.208	90
100	67.327	70.065	73.142	74.222	77.929	82.358	87.945	111.667	118.498	124.342	129.561	131.142	135.807	140.170	149.449	100

Source: Steyn, A.W.G., Smit, C.F., Strasheim, C. & Du Toit, S.H.C. (2000). Modern statistics in practice.