Profiling of unsecured debt defaulters

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ABSTRACT

With the global economy in a crisis, debt levels are at an all-time high. The United States of America's national debt exceeds $14 trillion and the South African outstanding gross consumer credit book is at R1,39 trillion. This pattern of debt levels is seen worldwide, with various adverse effects on the debtors and the economy in general. Although debt is an important mechanism in the growth of an economy, the amount of debt must be managed. Unsecured debt is a higher risk loan offered to debtors who cannot support the debt through any form of security. Default on this type of debt leaves the creditor with only a few options to recover the debt. It is thus important to understand the reasons for these defaults in order to manage the debtor and the risk associated with these loans.

This study investigates the default rate and demographics of unsecured debt defaulters. A large study population is analysed to determine the total default rate and demographics of the defaulting debtors. The aim is to get a better understanding of the risk involved in unsecured debt in order to manage the credit vetting process more efficiently. Factors including loan size, number of loans, geographic distribution, gender and the age of debtors are studied to determine the profile of a typical debt defaulter. This is then compared to the non-defaulting population.

The research findings confirm that there are statistically significant correlations between loan size, number of loans, geographic distribution, gender and age and the number of defaults in the population. The practical significance is, however, weak. It further proves that the profile of a defaulting debtors' book is the same as the initial debtors' book. A further challenge will be to incorporate affordability and other relevant data to understand the defaulting population and the reasons for default better.

Key terms: Unsecured debt, debt defaulters, demographics, credit crisis, debtors.

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CHAPTER 1. INTRODUCTION

1.1 INTRODUCTION

The period from 2001 to 2007 was characterised by a fast-growing world economy. This was the fastest growing six years in world history. In the second half of 2007, this world boom turned into a period of uncertainty, if not a world economic crisis (Wade, 2008:23). Large amounts of credit granted during the period of growth caused consumers to get used to a level of living. The period of economic downturn brought back the reality of repaying monies borrowed.

Credit, credit management, granting of credit and default on credit payback became increasingly important. This was a global phenomenon, with both countries and individuals feeling the pressure.

1.2 BACKGROUND TO THE STUDY

Granting of credit plays an important part in any economy. Credit can be granted in various forms and is usually used to purchase expensive items or as a short-term alleviation of cash flow. Without a system whereby debtors could borrow money, it would have been impossible for most people to own houses or cars. These industries would also be much smaller if they could exist at all.

There is risk involved in granting credit and in some cases, the debtors do not repay these debts at all. Financial institutions and other providers of credit must consider this risk when pricing the credit granted. These defaults reduce the institutional performance and investor confidence, resulting in an increase in the cost of capital. Interest rates are raised in order to mitigate the risk and additional fees are charged. The risk is further reduced by vetting debtors before granting credit. Credit scorecards

are widely used in the scoring process. This vetting process considers various aspects in order to identify potential defaulters. These include:

- Total credit exposure of debtor;
- Number of other loans;
- Attitude to debt;
- Previous judgements against debt;
- Credit bureaux data;
- Employment status of the debtor;
- Total expenses; and
- Gross and nett salary.

Creditors are constantly exploring additional factors that improve the credit scorecards. New trends in the development of scorecards include rudimentary psychoanalysis of debtors.

Various pieces of legislation protect debtors from exploitation. The National Credit Act aims to protect debtors from ruthless credit providers. With legislation protecting debtors and fierce competition among credit grantors to win business, it is now feared that a credit bubble will disrupt the economy (McGroarty, 2012:1). With debtors using 79% of disposable income to repay loans, this fear might not be unfounded. A total outstanding gross consumer's credit book of R1,39 trillion confirms this state of affairs (*Consumer Credit Market Report*, 2012:1)

Debtor default is not without consequences. Creditors are forced to proceed with legal action against debtors in order to recover monies outstanding. This in turn results in judgements against debtors, which in turn prevent them from obtaining further credit. Loan application rejection rates of 53.6% are another consequence of the high default rate.

To normalise the credit market, it is essential to understand debtors and the reasons for default. When the reasons for default and the demographics of defaulters are understood, the quality of scorecards can be improved and credit can be granted with reduced risk. This in turn will ensure more credit at better rates, which is essential to improve the economy.

1.3 PROBLEM STATEMENT

With the world in a debt crisis and the unsecured lending market growing at an alarming rate, it is increasingly important to understand the debtor's market and even more important, the default rate. Understanding debt and debtors will enhance the management of debt in the approval process in the form of improved credit scoring models. For purchased debtors' books, one can use performance prediction models to understand the risk in the specific credit market, as well as for pricing models.

With ageing loans and loan defaults, the 0 to 90 days portion of the debtors' book attracts more attention. In general, debt older than 180 days is problematic to collect, according to the industry. Previous studies regarding debt defaulters, e.g. those by Athreya (2008:752) and Lopes (2008:769), focussed on relatively small sample sizes and depended on the feedback of debtors to determine the level of default. Over the lifespan of the debt, the level of default is measured and the results should be the performance data of the loan population. The full extent of the level of debt default is lost if later stages of the loans are not taken into account.

If the total defaulting population is known, it can be further analysed to determine the demographics within this group, e.g. to understand if gender can be significantly implicated as a default risk (Lyons & Fisher, 2006:324).

A large population of debtors with sufficient long-term data will yield better understanding of the default rate within the unsecured loan market. This would enable better understanding of the long-term prospect of loan default or success in recovery of monies. Analysing the demographics of the defaulters can provide further details on the defaulters.

1.4 OBJECTIVES OF THE STUDY

1.4.1 Primary objectives

The primary objectives of the study are to:

- Establish the default rate of unsecured loans; and
- Analyse the demographics of the defaulting population.

1.4.2 Secondary objective

The secondary objective of the study is to:

- Determine the profile of non-defaulters.

1.5 SCOPE OF THE STUDY

The study will cover the area of unsecured debt in South Africa. A large database of debt history is available from I-Com Services (Pty) Ltd ("Vison database," 2013). This company provides web-based debt collection software and is involved in the purchase of debtor books. In this study, five of the debtor books, comprising similar unsecured loans, are used. The total number of loans included in the study is just over 1.2 million. To determine the default rate, a performance history of more than 10 years is used. These loans originated throughout South Africa, with similar criteria.

The study will place extensive focus on information technology, statistics, and finance in order to analyse and interpret the large volume of data successfully.

1.6 RESEARCH METHODOLOGY

1.6.1 Literature review

Library resources of the University of the North West will constitute the bulk of the research material. Additional resources will include publications and research conducted by the National Credit Regulator. Data obtained during the study, together with data from Trans Union, will be used to compare industry-wide results. Interviews with industry leaders have been conducted to compare the results from the study with current industry trends.

A broad outline of the review will include the following topics:

- The history of debt.
- The current debt problem.
- Demographics of debtors.
- Default on credit.

1.6.2 Empirical study

By making use of a quantitative research method, with a specific view on the demographics of the defaulters, the long-term default rate of unsecured debt will be determined. The study comprises five unsecured debtors' books originating between 1999 and 2002. The collection's history of these loans up to December 2012 will be included in the study. The basis for this analysis comprises 1 200 000 accounts with 27 000 000 payment transactions. Defaults are loans with no payment per calendar month, for the period 1999 to December 2012. The number of defaults per loan would be the sum of the defaults measured per period. Loans with a default for the total period are loans with a cumulative default count of more than zero.

To determine the demographics of the defaulting loans, the loan data obtained per account are used. These are analysed as follow:

- Gender distribution.
- Age distribution.
- Geographic distribution.
- Loan size distribution.
- Number of loans per defaulter.

1.7 LIMITATIONS OF THE STUDY

The study will be limited to the following:

1. Useable data available in the five debtors' books.
2. Data captured at the time of the loan application.
3. Unsecured loan data from within South Africa.

1.8 LAYOUT OF THE STUDY

The mini-dissertation is divided into four chapters:

Chapter 1

This chapter is the introduction to the study. It consists of the background and a problem statement to form the basis of the research. A short background of the South

African unsecured debt situation follows this. The last section of this chapter covers the research methodology.

Chapter 2

Chapter 2 consists of a literature study. This literature study covers the demographics of debt defaulters, demographics of debtors and various other aspects of debt. It outlines the global debt situation, addresses specific countries, and takes a more in-depth look at the South African situation. The focus throughout this chapter is on investigating the incidence and demographics of unsecured loans.

Chapter 3

This chapter comprises of the analysis of data obtained. It also covers the methodology used and the results of the secondary objectives.

Chapter 4

Chapter 4 summarises the results from the study and offers suggestions on practical implementation, together with a combined view of the primary and secondary objectives, with conclusions and recommendations. The mini-dissertation concludes by exploring possibilities for future research.

CHAPTER 2. THE DEBT CRISIS

2.1 INTRODUCTION

The global economy is at an all-time high super debt cycle. The United States of America's (US) national debt now exceeds $14 trillion. It is difficult for most people to contemplate this figure. Taking the weight of one dollar bill at one gram, $14 trillion would weigh 15.73 tons (Gordon, 2011:59). This would be the same weight as 70 Statues of Liberty.

The US is clearly finding itself in a crisis with debt equal to gross domestic product (GDP). In 2011, the US was forced to raise the debt ceiling or face insolvency (Morgan, 2012:44). The government resolved this crisis by borrowing $214 billion from federal pension funds. A year later, the debt ceiling crisis made headlines again. Consumer debt in the US followed the same trend, with nearly $12 trillion consumer debt at the end of 2011 (Krainer, 2012:3). About 70% of this consisted of mortgages and 6% of credit card debt.

In the United Kingdom (UK), personal debt stood at £1 310 billion as at February 2007. This equates to nearly £9 000 of debt per average household, excluding mortgage loans (Tapp, 2007:71). The real concern is not the total debt as such, but the rate of growth of personal debt, which is 10.5% per 12 months, or a staggering £116 billion per 12-month period. Another area concerning the debt problem is the number of insolvencies due to debt. Over 100 000 people became insolvent in the U.K. in 2006. The level of savings could only add to this problem. Twenty seven percent of people have no savings, and about 52% could survive financially for just 17 days (Tapp, 2007:73). The government is now implementing legislation to reduce the amount of debt taken up by consumers (MarketLine, 2006:6). In October 2011, the Greek government defaulted on its public debt. Data from the European commission showed the Greek public debt to GDP to be 143% in 2010 (Lemieux, 2011:5). Growth in government expenditure, especially growth in the welfare state, is one of the main reasons for this crisis in Greece.

There are great concerns in South Africa about a consumer debt bubble that is forming (McGroarty, 2012:1). Unsecured lending has tripled in the last four years. Nearly half the consumers are at least three months behind on debt repayments, according to the National Credit Regulator (McGroarty, 2012:2). Two of the biggest players in the unsecured lending market posted growth percentages of 219% and 656% respectively over the last five years (Kochan & O'Neill, 2012:2).

The total South African outstanding gross consumer's credit book was R1.39 trillion at the end of September 2012 (*Consumer Credit Market Report*, 2012:1). During this period rejected credit applications increased to 53.60%. Unsecured credit agreements increased from R25.80 to R25.97 billion for the same quarter. The total number of loans granted during this period amounted to 1 317 268 (*Consumer Credit Market Report*, 2012:15) and 76.34% of the cumulative unsecured book was reported to be current in the third quarter of 2012 versus 69.22% in the third quarter of 2000 (*Consumer Credit Market Report*, 2012:17).

2.2 THE HISTORY OF DEBT

"A national debt, if it is not excessive, will be to us a national blessing," said Alexander Hamilton, the first secretary of state of the US treasury (Gordon, 2011:59). He was right, the US successfully used national debt to save its economy during the Revolution and the Second World War. National debts did, however, not stay "not excessive", and rose from $1 trillion to $3 trillion during Ronald Reagan's term as president of the US. It further rose to $5 trillion during Bill Clinton's term and to a staggering $10 trillion under George W. Bush. The national debt is now standing at 98% of GDP.

At the end of the Revolution, the central government was in a predicament where it was unable to pay its debts. It did not have the power of taxes and had to borrow money from the state, which paid haphazardly. By issuing bonds, Alexander Hamilton refinanced the debt. He was of the opinion that a well-financed and secure national debt was in the best interest of the US. By this time, the British government had already implemented a central bank and a government-based bond that was tradable on the stock exchange. By 1795, American bonds were performing above par in the

European markets. By 1811, the US government had reduced its debt to about $45 million and the economy was growing.

This all changed with the war of 1812, when debt rose again to $123 million. The government started repaying the debt after the war. Andrew Jackson entered parliament in 1829 and declared the national debt a curse; it was at a level of $58 million at that time. It took Jackson six years to reduce the debt to zero and that was the first and only time the US government was debt free. The reason for the great depression and the first stock market crash was Jackson's stance on debt.

The Civil War changed the face of debt once again. The way in which the North and South funded the war differed substantially. Jay Cooke was responsible for the issuing of bonds to raise money. Changes in the denomination of bonds made it possible for individuals to purchase bonds. This was the main mechanism of funding for the North and is still a major method of funding wars today.

While the North relied on bonds to fund its war efforts, the South printed more money to fund the war. This caused soaring inflation and disrupted the Southern economy. The war increased the national debt to $2.75 billion. With an improving economy, the government worked down the debt to $1.18 billion by 1914, which amounted to 3% of GDP.

Franklin Roosevelt was the first president to make an unbalanced budget a matter of deliberate policy and in 1930 the national debt rose to $16.1 billion which was 17% of GDP (Gordon, 2011:62). World War II drove up the national debt to $269 billion at 129% of GDP, the highest it has ever been. After the war, the government did not attempt to reduce the debt but did take measures not to increase it. With a booming economy where GDP grew from $222 billion to $518 billion, the percentage of debt to GDP shrunk to 57.5%, whereas it was at 129.8% at the end of the war.

In the 1960s, the influence of John Maynard Keynes was prevalent in the US government. High spending and low taxes were the order of the day. Revenue by large kept up with spending, arguably because of the Kennedy tax cuts. In the 1970's unemployment rose and inflation was the highest ever in peacetime. Ronald Reagan induced a deep recession in the 1980's that brought inflation to a halt. He also introduced tax cuts and an increase in military spending. Over the next decade, the

debt tripled to $3.2 billion at 58% of GDP. The first year the federal budget indicated a surplus was 1998. This situation kept improving until 2001 with four consecutive budget surpluses.

A turn in debt occurred during the administration of George W. Bush until the 2008 financial crisis, at which point the government debt reached new heights. Currently, US debt is at 98% of GDP.

2.3 THE CURRENT DEBT PROBLEM

United States

To prevent insolvency, the US faced an increase in its debt ceiling in 2011. The government raised the debt ceiling by borrowing $214 billion from federal pension funds (Morgan, 2012:44). Total US debt is at a level of $14 trillion, supporting a budget deficit of $1.3 trillion. This debt cycle nightmare has been attributed to the elimination of the gold standard, the impact of changes in demographics, loss of economic infrastructure and being a hostage to oil (Morgan, 2012:44).

To improve the economy, consumers must spend and this implies an increase in consumer debt. The right amount of consumer debt created mixed reactions looking at the amount of consumer debt and the growing rate thereof. Households defaulted on mortgages and had lower credit scores due to some consumer cutbacks within the economic recovery.

The US consumer debt is at a level of $12 trillion, of which 70% consists of mortgage debt. Automobile loans represent 7% and bank credit cards 6% of the total consumer debt (Krainer, 2012:3).

In 1956, the US income-to debt-ratio was at 9.5%, a historical turning point. In 1988 this number was 19% and demographics were implicated as a dominating factor leading to the upward trend in the ratio (Silvia & Whall, 1988:56).

Japan

The Japanese government will never be able to repay its debt by legitimate means. The last time the Japanese economy ran a fiscal surplus large enough to pay debt interest alone was in 1991. This is only the interest portion and not paying back any capital amount. Gross debt is at a staggering level of 235.8% of GDP (Boone & Johnson, 2012:1). The Japanese debt level is roughly twice that of Italy, the most indebted country in Europe. To pay its debt, the Japanese government will have to borrow more money than it collects in taxes (Berry, 2012:42). The Japanese government bonds are at the lowest level in the word at around 1%. Local institutions and individuals hold most of these bonds. Japanese banks, pension plans, insurance companies and the huge postal system account for the majority of bond holders.

Decades of savings have allowed the government to finance internal government budget deficits and keep the central banking system and economy afloat (Berry, 2012:42). This and the large amount of assets abroad have been the saving of the Japanese government. In total the Japanese economy can, however, be seen as heading towards a debt crisis.

Their aging population and shrinking population further exacerbate the current situation. Their medium term prospect is widely expected to deteriorate until 2015 with an estimate debt-to-GDP percentage of 247%.

China

The volume of consumer debt increased from ¥17.2 billion in 1977 to ¥6.41 trillion in 2010 (Jiangqun & Xiaoyan, 2012:1263). Bank loan volumes increased 373-fold in the same period. Credit card debt and mortgages account for most of these debts.

Capital markets are tightly controlled in China. Interest rates for deposits and loans are regulated by government to ensure the state-owned banks have a profitable spread between low deposit rates and high loan rates (Dorn, 2013:78). Privatisation and real capital markets have been inhibited by government's interventions.

China's foreign reserves have risen from $2.5 billion in 1980 to a current estimate of $3.4 trillion.

Australia

The probability of households being constrained is significantly affected by demographic and economic factors such as age, home ownership, weekly household income and the share of income going to repayments on mortgage debt (La Cava & Simon, 2005:40). In 2003 household debt rose to a point where the ratio of disposable income was at a level of 143%. In the study of La Cava and Simon (2005:40) it is seen that default on utilities are one of the first signs of financial distress. A further variable in this study is the total amount of monthly income going towards the repayment of mortgage debt. This is an important factor to consider in the probability of default or being constrained.

Australian households seem willing to carry higher levels of debt without financial stress. It seems as if the increase in debt in Australia is the result of a voluntary household choice and not associated with increased household financial distress. Financial stress is rather a function of the demographics and socio-economic characteristics of households and to a lesser extent debt portfolios (Worthington, 2006:13). Demographics causing financial stress in Australian households are the presence of children, the number of dependants, income-earning units, and age of the household head.

The payment of utility bills is first to default, followed by mortgage or rent. Consulting with friends and family, followed by pawning of assets, provides financial assistance. Younger households appear to have higher levels of debt and that might be because they only recently obtained mortgage loans.

United Kingdom

In the UK households are struggling to repay debts. A rise in unemployment and increase in the cost of borrowing may leave consumers in acute difficulties. The government has changed the banking code in order to control the rate at which consumers are taking on new debt (MarketLine, 2006:6). The average household debt in the UK is nearly £9 000, excluding mortgages, with a total personal debt of £1 310 billion (Tapp, 2007:71). Personal debt increases by £1 million every 4 minutes and 20

seconds. The UK has the highest debt per capita vs. the rest of Europe ("UK consumers carry a heavy load of debt," 2006:3). Britons have a culture of buy now and pay later. Germans and the French are particularly averse to debt.

In the UK, the views of bankers and economist are also in conflict. Bankers do not see a problem with the levels of consumer debt. According to the bankers, people borrow money to smooth expenditure and the majority will be able to manage the situation. Mostly because of unforeseen changes in their circumstances, debtors are unable to cope and this can be seen as an unfortunate event. It seems to be difficult to determine the enormity of the debt problem.

Further to the debt problem, the extent of personal savings is an additional concern, with less than half of the population being able to survive for longer than two months on their savings, 27% of the population having no savings at all and 25% having less than £3 000's worth of savings. Fifty-two percent of the nation could survive financially for only 17 days. Unsecured loans make up more than 50% of the personal loans ("UK consumer credit: unsecured personal loans make up half of market," 2006:117). In the age group 18 to 24, 15% thought an individual savings account was an iPod accessory and 10% thought it was an energy drink.

Greece

The Greek government's defaulting on its debt and attempts to determine how this situation came about drew a lot of attention.

The Greek state had built up an unsustainable public debt that other European taxpayers did not want to shoulder. This was not a consequence of the recent recession but was essentially structural. The recession merely precipitated the catastrophe. Greek public debt to GDP reached a level of 143% in 2010, while back in 1970 it was only at 20% of GDP. The damage was done before the recession (Lemieux, 2011:5). Part of the Greek problem was the high government spending and the stagnation of taxes. Government was neither able nor willing to enforce higher tax rates. This trend is a very familiar occurrence in many other countries.

Russia

Russia was in a serious debt crisis post-Kremlin, with a 50% debt-to-GDP ratio at mid-1998 (Gobbin & Merlevede, 2000:142). By the end of 1998, it had already grown to 79% of GDP. Even though this was a desirable level for some European countries, there were distinct differences. The first of this was the difference in the statistical definitions between the European Union and Russia. This made it difficult to obtain real comparative data. Secondly, the revenue-to-GDP ratio declined in Russia from 14.5% to 9% between 1993 and 1998. European countries had better ratios in this area.

Russia's recent debt mostly consists of loans granted by the International Monetary Fund and the World Bank. Other sources of funding include foreign governments and Eurobond emissions ("Russia: Debt restructuring looms," 2009:1).

South Africa

The National Credit Act came into effect in June 2006. This act regulates the credit industry in South Africa. The National Credit Regulator from which one can determine the state of credit in South Africa, publishes statistics. A summary as at September 2012 is as follows:

Credit Provider	**Value**	**Percentage**
Banks	R 92.26 billion	84.08%
Retailers	R 4.99 billion	4.55%
Non-bank vehicle financiers	R 6.11 billion	5.57%
Other credit providers	R 6.36 billion	5.80%

Table 2.1. South African credit providers (Consumer Credit Market Report, 2012:4).

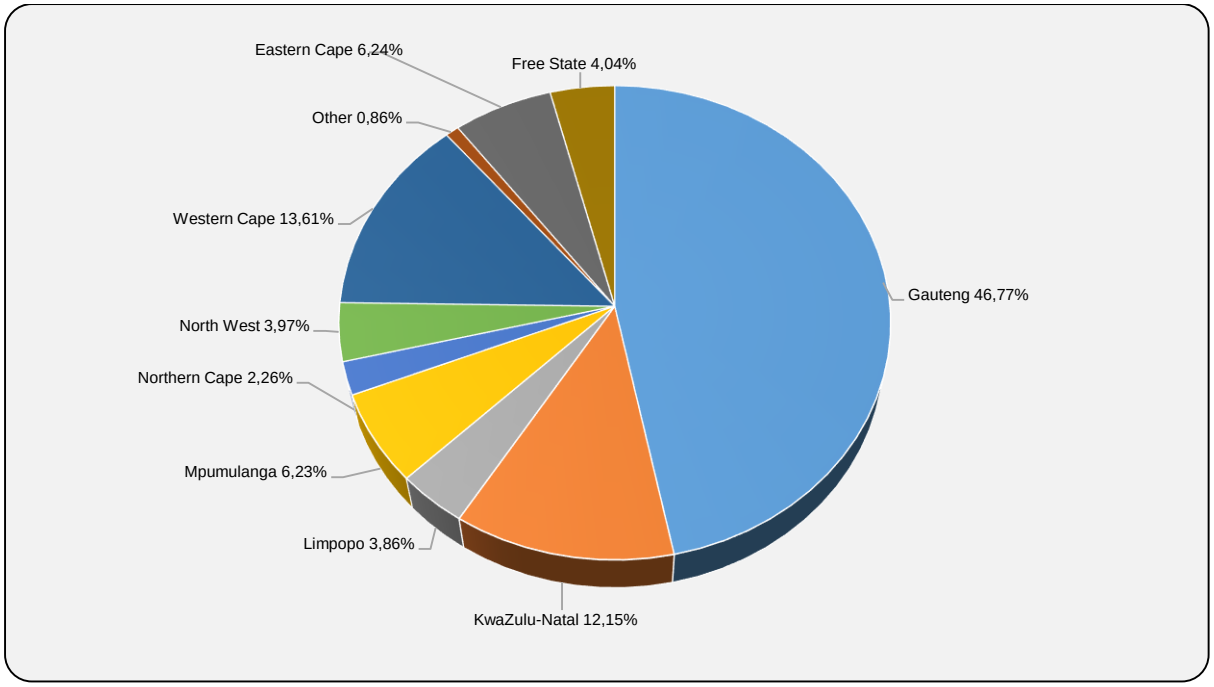

Figure 2.1: Provincial distribution of credit granted - 2012 -Q3 (Consumer Credit Market Report, 2012:6)

Gauteng province accounted for the highest amount of credit granted at 46.77%. The province in which the second largest amount of credit was granted was the Western Cape at 13.61%. A small percentage (0.86%) could not be identified from the data analysed.

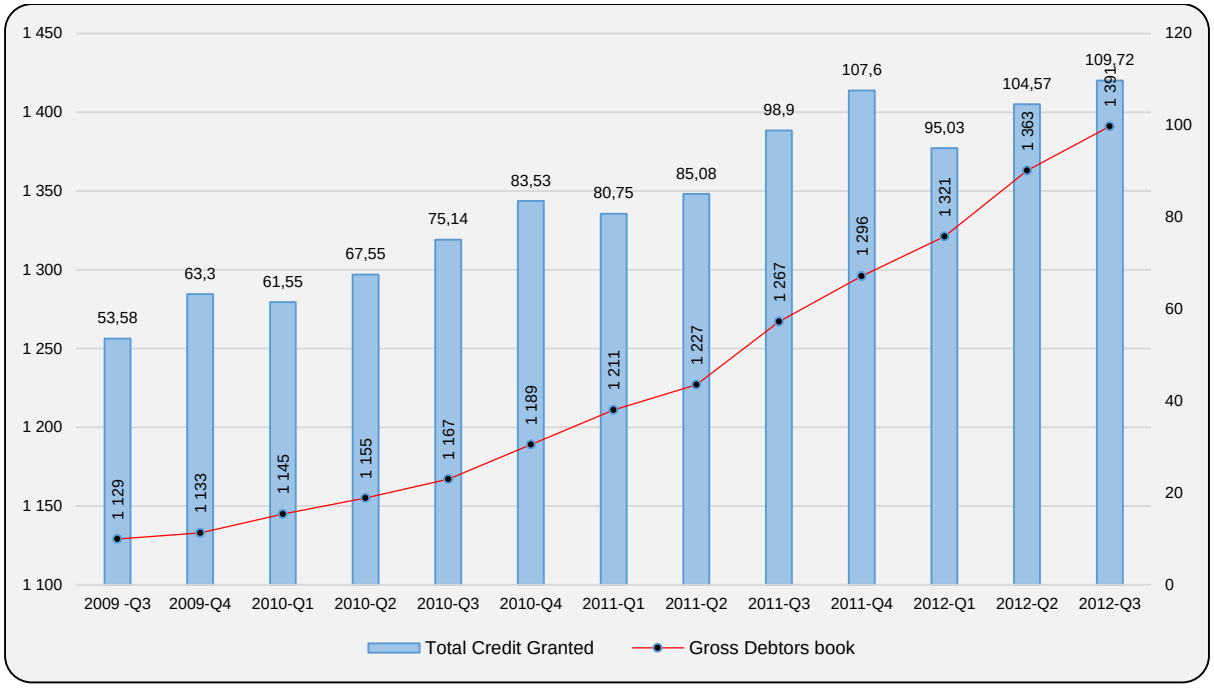

Figure 2.2: Total credit granted and gross debtors' book at September 2012 (Consumer Credit Market Report, 2012:3).

Banks still dominate the credit market, with other credit providers being the second biggest group. Other credit providers include pension-backed lenders, development lenders, micro-lenders, agricultural lenders, insurers, non-bank mortgage lenders and securitised debt.

Total consumer credit in South Africa amounts to R1.39 trillion, with a quarter-to-quarter growth of 2.01%. The number of rejected applications increased by 2.76% (from 50.84 to 53.60%), in the previous quarter. Unsecured credit increased from R25.80 billion to R25.97 billion, which represents a 0.67% increase from the previous quarter (*Consumer Credit Market Report*, 2012).

Agreements	2011-Q3	2011-Q4	2012-Q1	2012-Q2	2012-Q3	% Change (Q3/Q2)	% Change (Y/Y)
Gross debtors' book (**R000**)	101,102,222	112,988,681	120,811,141	131,309,923	139,978,673	6.60%	38.45%
Number of accounts	7,073,980	7,506,030	7,443,628	7,549,183	7,430,216	-1.58%	5.04%

Table 2.2. Gross debtors' book and number of accounts (Consumer Credit Market Report, 2012:4).

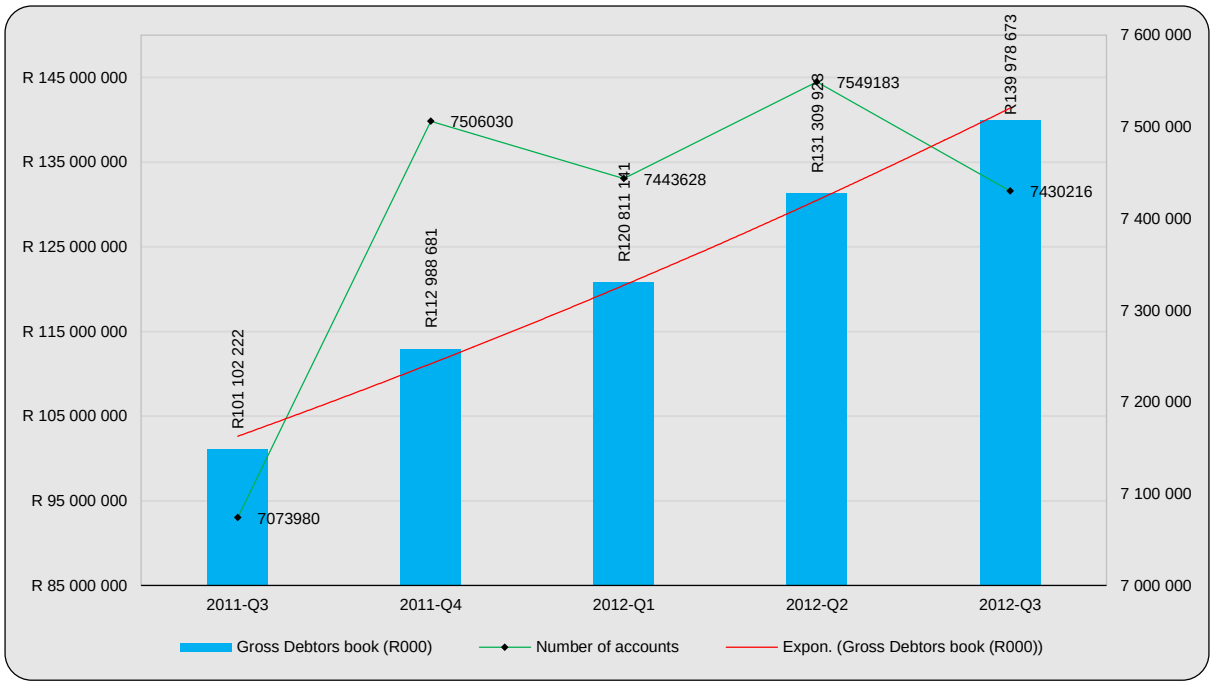

Figure 2.3: Gross unsecured debtors' book and number of accounts (Consumer Credit Market Report, 2012:16).

Analysis indicates that the value of unsecured loans is increasing at a rate of 138% year on year.

The National Credit Regulator does not specifically address the issue of debtor defaults. Credit providers do not necessarily want these statistics known, as this might affect their investor relations.

There will be continued growth in the unsecured lending market. The definition of unsecured lending is loans with no inherent underlying security. The National Credit Regulator has a supervisory mandate within the unsecured credit market and is, therefore, responsible for protection of the consumer as well as for promoting and advancing the social and economic welfare of South Africans. Consumers should

have access to credit and it should be a sustainable environment. Unsecured credit becomes very complex in this regard. Credit suppliers face a higher risk owing to the unsecured nature of loans; they must adhere to relevant regulatory bodies regarding the rates and fees on the loans, and should be cognisant to be fair, transparent and responsible. The strain on obtaining mortgage loans after the implementation of the National Credit Act and the financial crisis of 2008 increased the demand for unsecured loans. It became increasingly more difficult for debtors to obtain a 100% mortgage loan, which forced them to supplement their mortgage loan with an unsecured loan. The combination of accessibility to credit, sustainability, regulation within the industry and increased risk for credit providers focused a lot of attention on this sector.

The reasons for the increased demand in unsecured credit are complex, but this is the fastest growing credit type year on year with 49.9% growth between 2010 and 2011. Individual affordability and the national consumer level of indebtedness should be considered when evaluating the unsecured debt levels. Rising levels of impaired accounts as reported by credit bureaux are an indication of stress in the unsecured credit market.

There is a link between access to credit, pricing levels and credit risk. Debtors who do not qualify for secured or other forms of loans are forced to venture into the unsecured credit market. Higher prices of credit will force a large portion of these debtors into default. This in turn increases the risk for credit providers who will respond by changing the qualification criteria and increasing prices, leading to diminished access to credit, higher rates and higher defaults. These consumers have an impairment rate of between 38% and 46%, depending upon the source of information (Research on the increase of unsecured personal loans in South Africa's credit market, 2012). These accounts are on average three months and more in arrears. A portion of 7.3 million of the 19.3 million credit-active consumers will thus have accounts that are more than three months in arrears. According to the credit bureaux, about 3.6 million consumers are “deeply impaired." Clearly, a high percentage of consumers cannot keep up with their financial commitments. Credit providers and other stakeholders in the industry do, however, feel that there is no immediate threat against the safety and soundness of the financial system because of the growth in unsecured

lending. The debt-to-income ratio of the South African consumer is at 74.7%. This percentage has also increased steadily, compared to the 2004 levels.

Ageing	2010-Q3	% of Total	2010-Q4	% of Total	2011-Q1	% of Total	2011-Q2	% of Total	2011-Q3	% of Total
Current	R 50 117 434 228	75.74 %	R 56 731 285 723	76.87 %	R 61 581 006 584	76.15 %	R 66 788 801 560	75.92 %	R 76 228 581 219	75 %
30 Days	R 3 133 143 567	4.73 %	R 3 784 212 150	5.13 %	R 4 919 362 373	6.08 %	R 5 642 722 341	6.41 %	R 6 639 388 739	6 %
31-60 Days	R 1 146 562 194	1.73 %	R 1 203 582 546	1.63 %	R 1 599 974 651	1.98 %	R 1 766 558 202	2.01 %	R 2 063 524 156	2 %
61-90 Days	R 887 704 215	1.34 %	R 836 174 689	1.13 %	R 1 061 463 979	1.31 %	R 1 257 002 349	1.43 %	R 1 430 448 085	1 %
91-120 Days	R 1 058 264 369	1.60 %	R 1 010 230 985	1.37 %	R 1 011 196 199	1.25 %	R 1 229 528 934	1.40 %	R 1 464 386 830	1 %
120+ Days	R 9 830 469 808	14.86 %	R 10 231 799 864	13.86 %	R 10 691 526 362	13.22 %	R 11 293 306 935	12.84 %	R 13 521 392 534	13 %
Total	**R 66 173 578 381**	**100 %**	**R 73 797 285 957**	**100 %**	**R 80 864 530 148**	**100 %**	**R 87 977 920 321**	**100 %**	**R 101 102 221 563**	**100 %**

Ageing	2011-Q4	% of Total	2012-Q1	% of Total	2012-Q2	% of Total	2012-Q3	% of Total
Current	R 88 926 537 191	79 %	R 94 514 486 191	78 %	R 100 242 693 804	76 %	R 109 049 687 134	78 %
30 Days	R 4 624 932 726	4 %	R 4 910 594 574	4 %	R 6 234 485 364	5 %	R 5 615 425 411	4 %
31-60 Days	R 2 000 489 178	2 %	R 2 480 227 873	2 %	R 2 831 325 714	2 %	R 2 696 737 992	2 %
61-90 Days	R 1 443 986 459	1 %	R 1 727 311 282	1 %	R 2 153 629 944	2 %	R 2 040 580 971	1 %
91-120 Days	R 1 628 299 012	1 %	R 1 696 117 302	1 %	R 2 210 926 598	2 %	R 2 341 761 432	2 %
120+ Days	R 14 364 436 133	13 %	R 15 482 404 195	13 %	R 17 636 861 436	13 %	R 18 234 480 495	13 %
Total	**R 112 988 680 699**	**100 %**	**R 120 811 141 417**	**100 %**	**R 131 309 922 860**	**100 %**	**R 139 978 673 435**	**100 %**

Table 2.3. Analysis of 120+ days by value (Consumer Credit Market Report, 2012:26).

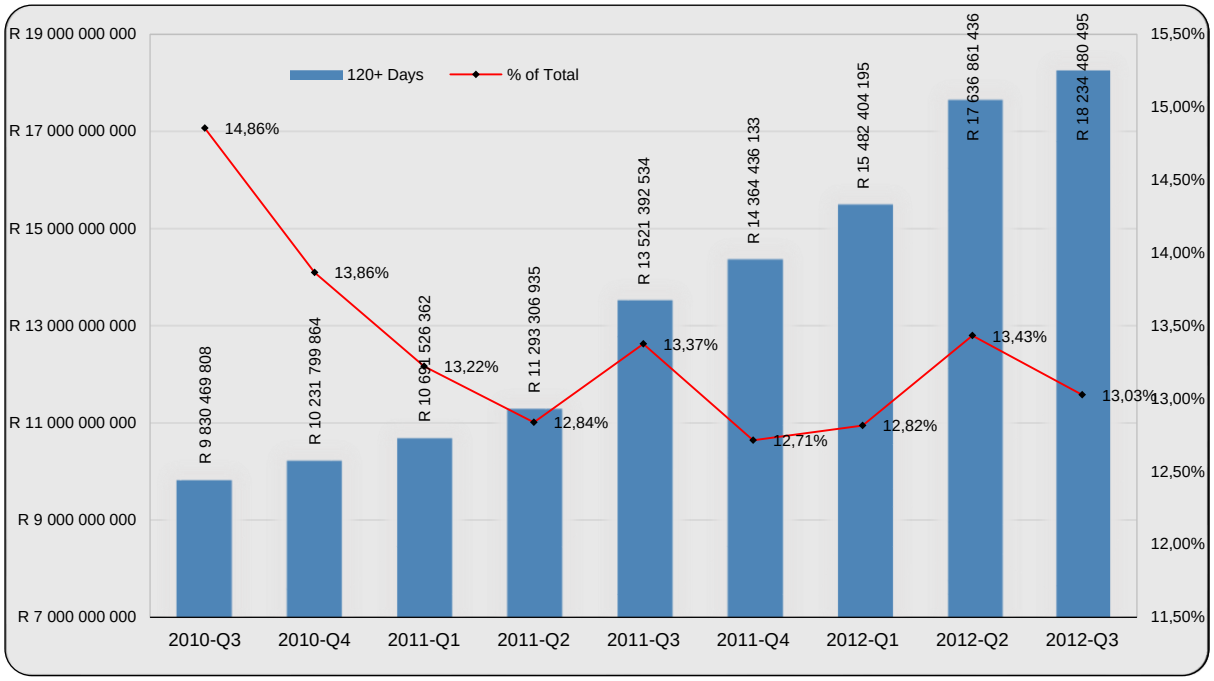

Figure 2.4: Analysis of 120+ days by value (Consumer Credit Market Report, 2012:26).

Figure 2.4 above illustrates the rise in the value of unsecured loans in the 120 + days range (*Research on the increase of unsecured personal loans in South Africa's credit market*, 2012). The percentage of the entire unsecured loan book stays within a small variation. The total value of the loans in the 120+ days increased dramatically over the period 2010-Q3 to 2012-Q3. A 46.09% increase in loan value was realised over this period. This is an indication of the default rate or increase in default rate expected within this book. Consumers seem to find it more difficult to keep up with the payments of their unsecured loans; this is confirmed by the increase in the age of the 120+ days of the book.

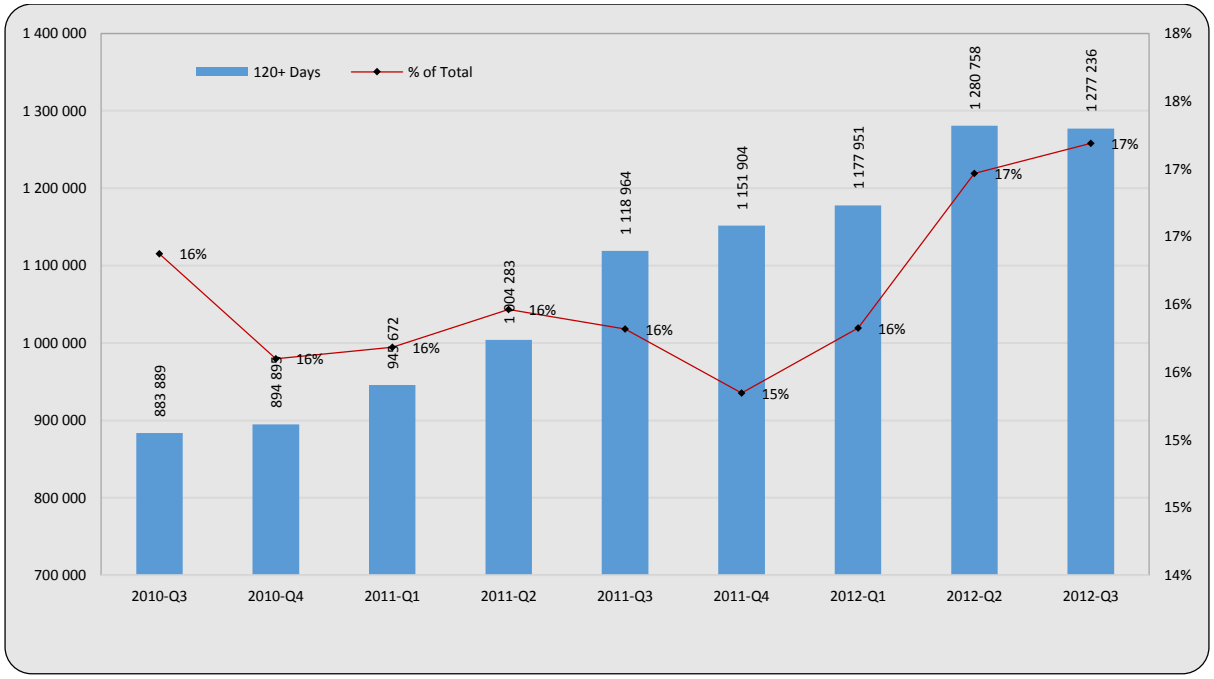

Figure 2.5: Analysis of 120+ days by number of accounts (Consumer Credit Market Report, 2012:26).

Looking at figure 2.5 above, the same trend is seen in the number of accounts in the 120+ days ageing bracket. A 30.80% increase in the number of accounts in the age bracket is noted in the same period.

Ageing	2010-Q3	% of Total	2010-Q4	% of Total	2011-Q1	% of Total	2011-Q2	% of Total	2011-Q3	% of Total
Current	3 883 227	72 %	4 198 885	73 %	4 342 028	72 %	4 474 018	71 %	5 075 476	72 %
30 Days	300 711	6 %	329 368	6 %	392 228	7 %	424 751	7 %	452 860	6 %
31-60 Days	122 100	2 %	118 583	2 %	147 707	2 %	156 920	2 %	169 627	2 %
61-90 Days	93 665	2 %	88 030	2 %	103 569	2 %	115 690	2 %	123 309	2 %
91-120 Days	114 909	2 %	107 013	2 %	99 007	2 %	115 868	2 %	133 744	2 %
120+ Days	883 889	1 6%	894 895	6 %	945 672	16 %	1 004 283	16 %	1 118 964	16 %
Total	**5 398 501**	**100 %**	**5 736 774**	**100 %**	**6 030 211**	**100 %**	**6 291 530**	**100 %**	**7 073 980**	**100 %**

Ageing	2011-Q4	% of Total	2012-Q1	% of Total	2012-Q2	% of Total	2012-Q3	% of Total
Current	5 543 500	74 %	5 393 472	72 %	5 332 237	71 %	5 281 661	71 %
30 Days	380 671	5 %	400 941	5 %	413 838	5 %	384 290	5 %
31-60 Days	172 006	2 %	201 241	3 %	204 792	3 %	184 025	2 %
61-90 Days	124 835	2 %	141 625	2 %	159 906	2 %	140 518	2 %
91-120 Days	133 114	2 %	128 398	2 %	157 652	2 %	162 486	2 %
120+ Days	1 151 904	15 %	117 7951	16 %	1 280 758	17 %	127 7236	17 %
Total	**7 506 030**	**100 %**	**7 443 628**	**100 %**	**7 549 183**	**100 %**	**7 430 216**	**100 %**

Table 2.4. Analysis of 120+ days by number of accounts (Consumer Credit Market Report, 2012:26).

2.4 DEMOGRAPHICS OF DEBTORS

People borrow money for various reasons. The availability of credit to these groups differs depending on the type of debt sought, and the credit criteria of the institute. Suppliers of credit usually look at the risk involved in granting the credit or underlying assets to secure the debt. This makes it more difficult for low-income groups to obtain credit. Unsecured credit is usually an alternative for these debtors, who will obtain the loans at higher interest rates. These debtors make use of the loans to smooth periods of income shortfall or accelerated accumulation of assets (Sullivan, 2008:409).

Consumers are provided with credit by various means. These include bank overdrafts, credit cards and unsecured loans. Although this was mainly a trait of the Western world, China started using credit cards on a larger scale in 2009, with a mass mail campaign targeting 18.6 million debtors. This increased number of credit card users by 30.4% in less than a year (Wang, Lu, & Malhotra, 2011:179). In the same year, US credit card debt totalled $91.5 billion. In other countries such as Taiwan, credit cards were deemed as one of the three poisons of society, along with drugs and guns. People became slaves to the use of credit cards.

The use of credit cards and other forms of credit differs between cultures. In Western society, there is an attitude of spend now and pay later, while the Eastern cultures believe one should first save and then spend. Convenience and the ease of owning upfront is a big driver towards the use of credit. This is also seen in the rise in credit card usage in Islamic countries, where interest is prohibited, making it a convenient method of payment (Abdul-Muhmin & Umar, 2007:219) .

It is increasingly important to identify debtors from non-debtors and to determine which factors will influence the decision to repay debt or not. Psychological factors and demographics are two types of variables used to identify or predict debtor behaviour. Economic resources, economic need variables, social support, attitude-forming variables, and attitude variables could discriminate debtors from non-debtors (Wang et al., 2011:180). It has also been found that debtors display an external locus of control, have lower self-efficiency, view money as a source of power and prestige, take fewer steps to retain money and present a lower level of risk seeking. Self-control, self-esteem, self-efficacy, deferring gratification, locus of control and impulsiveness

were negatively related to frequency of credit use. People scoring high in these variables can normally manage their finances and will control their behaviour to avoid carrying too much debt. Compulsiveness is seen as a driver of higher levels of debt because these individuals cannot control their urges to spend money (Wang et al., 2011:190). The amount of debt positively relates to the number of credit cards.

Debtors also seem to have fewer money management facilities and they rate their ability to manage money lower. Low-income families have a materialistic drive to enter into instalment plans.

Consumers make use of debt as a display of social power. Power in modern society is an indicator of material wealth. Growth in income can usually not keep up with the growth in debt. People's attitude to debt also influences the amount and type of debt. People with a positive attitude to debt do not see it as a negative and use revolving credit more frequently to maintain their lifestyles. The level of knowledge about debt reduces the amount of debt because of awareness of the cost of revolving debt.

The level of debt can be explained by institutional factors, decision-behaviour factors, socio-economic factors and psychological factors (Wang et al., 2011:181). Demographic variables, economic variables and enduring psychological variables can account for almost 66% of the variance in personal debt (Livingstone & Lunt, 1992:111). In other studies, the strongest predictor of debt was found to be lack of financial knowledge (Norvilitis et al., 2006:1395). The number of credit cards, attitudes to possessions and spending, delay of gratification and credit card habits were also predictors of debt.

According to John Maynard Keynes's general theory of employment, interest and money, consumption is a function of income. As income rises, so will spending. Keynes noted consumer expenditure could rise above a level somewhat less than the increase in income (De'Armond & Zhu, 2011:2). This is an important phenomenon to keep in mind when evaluating consumer debt. Debtors' consumption decisions are also influenced by the consumption patterns of their peers. This may lead to higher levels of consumption than expected (Arrow, 1950:906).

It is also important to look at the measurement of debt. The absolute amount of debt is cumulative and therefore the most common measurement is the total amount of

debt outstanding. It is difficult to determine the level, intensity or severity of debt based on only an outstanding amount. Debt-to-income ratio has been used to overcome the shortcomings of this measure (DeVaney, 1995:137). This ratio can also present some problems, seeing that there is no consensus on the correct ratio and certain population groups, e.g. students, have no fixed or determinable income.

Various studies also indicate inconsistencies in the current knowledge of debt and debtor behaviour. Livingstone and Lunt (1992:111) and Kim (2001:67) claimed that disposable income was positively related to the amount of debt, while Zhu (1994:403) concluded that family income had a negative effect on the amount of debt. The role of age, gender and marital status remains unclear. Some studies indicate that the better a debtor's financial knowledge, the more debt the person has (De'Armond & Zhu, 2011:2; Robb & Sharpe, 2009:25). Other studies conclude that lack of financial knowledge is a reason for increased debt (Norvilitis et al., 2006:1395). The age group between 35 and 44 has been identified as high users of debt (Kinsey, 1981:172)

It has been found that income, age and profession are always highly correlated (Kinsey, 1981:172). Males have also been found to be higher users of credit (Wang et al., 2011:186). This might be because females are more prudent in financial decisions (Tang, 1993:93). People in the age range 19 to 24, use less credit than people in the age group 25 to 35 (Livingstone & Lunt, 1992:111). In total, the relationship between age and credit use is unclear.

It is generally accepted that different kinds of debt have their own features. It is also clear that there is a geographic difference due to the differences in cultural attitude to debt.

2.5 DEFAULT ON CREDIT

Unsecured debt has become an important part of the credit market. This form of lending gives access to credit where credit could not be accessed before, although the risk and cost of these types of loans are much higher than those of other types of debt. This is an important mechanism for smoothing consumption during periods of negative transitory income shocks.

An increase in personal bankruptcy can be seen as an indicator of default on debt (Xiong, Wang, Mayers, & Monga, 2013:665). An early indication of bankruptcy is an increase in debt prior to the event. Two groups of defaulters emerge at the final point of default, namely those who file for bankruptcy and those who follow an informal path of bankruptcy. Debtors who do not file for bankruptcy usually wait for creditors to file for bankruptcy. There is a chance that the creditor will not file for bankruptcy, and the debtor will get a "free ride". This is becoming more attractive to debtors because this strategy is becoming more effective, especially if the debtors do not have many attachable assets (Agarwal, Liu, & Mielnicki, 2003:275).

The increase in the number of personal bankruptcies has been a concern for policy makers and suppliers of credit. This can cause instability in the financial sector. From a creditor's point of view, there should be some form of punishment when a debtor declares bankruptcy. This was part of Roman law, and the word bankruptcy originated from the Latin words for "bench" and "break." Creditors would have physically broken the defaulter's workbench after the assets had been distributed between the creditors. This served as punishment and warning to other debtors to pay their debts (DeVaney, 1995:140). Today a debtor will lose some or all assets and will not be able to obtain further credit for a period.

Social stigma has changed a lot over time and is not a deterrent for debt defaulters any more. Society does not react in the same way against debt defaulters or sequestrations as it did previously (Lopes, 2008:770).

Changes in the bankruptcy laws and the differences in the law by regions and geographical area provide for differences in the motivation to file for bankruptcy. Bankruptcy can also usually be filed under more than one section, with different disincentives for the debtor.

Factors affecting default include:

- Education level, which is inversely related to default rate (Erdem, 2008:159).
- Age of the head of the household (DeVaney, 1995:140). Younger people in charge of households default more often than older heads of households. Households with a head under the age of 35 have a four times higher chance of default (DeVaney, 1995:141). Financial needs increase with age.

- Gender: Women tend to be debtors more frequently, while men have a better attitude to debt (Erdem, 2008:164). Men and women differ in the use and perception of the value of money (Zelizer, 1997:1).
- Number of children. More children increase the chance of default, which is expected in view of the increased expenses per child (Erdem, 2008:168)
- Number of loans. More loans increase the default rate.
- Debt-to-income ratio. Higher income levels default less frequently than lower income levels (DeVaney, 1995:104). (Erdem, 2008:168) proved this to be the highest marginal impact on default.
- Marital status (DeVaney, 1995:141). Dual income in marriages relates to lower levels of defaults. Divorced women with a single income have a higher propensity to default.
- Proportional payment of expenses.
- Renters had almost double the incidence of default compared to home owners (DeVaney, 1995:140).
- Prior credit history. Previous rejection of credit applications. According to (Canner, 1990:55) this is the variable with the greatest statistical significance in the prediction of default. (Gross & Souleles, 2002:21) also found accounts with lower credit scores to be a higher default risk.
- Larger balances or smaller payments were found to be a higher default risk (Gross & Souleles, 2002:21).
- Unemployment and lack of health insurance increased the risk of default (Gross & Souleles, 2002:21).

Gender:

In certain geographic areas 60% of microfinance clients are women, e.g. the Philippines (Perez, 2012:46). In the Philippines, the incidence of default was 0% in female population studies. This might be because in each case a guarantor was required for the loan. The attitude of the women was also that maintaining a credit status of good standing would enable them to obtain further loans. Eighty-four percent of the women from this study had a college education and earned a high income for

the region. The probability of default was solely a function of the guarantor in this study.

Prediction models on which populations will recover from default on payments use similar demographic variables. Among the variables, the number of purchasing months and the average frequency of repayments were most predictive (Ho Ha & Krishnan, 2012:773).

An estimated number of over one billion people are classified as poor, of which over 75% are women. More than 20% of the world population fall within this category and the high number of women in this category would create an expectation of women being a large group of the defaulting population (Lucarelli, 2005:82).

Divorced women find it more difficult to keep up with debt repayment (Lyons & Fisher, 2006:324). The same is true for men, but women keep up with repayments when they receive social grants, whereas social grants do not increase the repayment trend of males. Both males and females do worse after divorce than people in married households.

2.6 CONCLUSION

Debt is a worldwide phenomenon and seems to be an ever-increasing problem. The increase in the levels of debt can be attributed to the general state of the economy and debtors' attitude to debt. Unemployment and other adverse economic conditions create a favourable condition for micro-lenders to extend credit to struggling debtors. Although debt is essential to sustain the economy, the levels of debt can become problematic and default on debt is the result of such increasing levels of debt. Certain groups within the population make use of unsecured debt on a more frequent basis. There seems to be a relationship between the demographics of debtors and defaulters. Women are more likely to incur debt and therefore more prone to default on debt. People younger than 35 years of age are at higher risk to default than those older than 35. This might be due to a higher financial burden at this age, when individuals acquire more life essentials than their older counterparts. Other factors, such as loan size and the number of loans, also influence the ability to repay loans.

CHAPTER 3. EMPIRICAL RESEARCH AND RESULTS

3.1 INTRODUCTION

Previous studies regarding the profiling of defaulters relied on questionnaires completed by debtors (Lopes, 2008:752). The sample sizes of these studies were relatively small. A usual problem in working with debtors' data, is the unwillingness of financial institutions or micro-lenders to provide information. Debtors are frequently targeted by rival companies to settle their loans and to take a new loan. Therefore providers of credit do not easily provide data regarding debtors. Financial institutions are further governed by confidentiality clauses prohibiting them from sharing information. Another inhibiting factor is that defaults are usually measured over a short period, not taking into account the progress over the lifespan of the loan.

The number of defaulting payments has been used to identify debtors as good or bad (Karlis & Rahmouni, 2007:1). This approach has also been used to predict the number of defaults in the near future in order to manage the risk associated with loans. Personal characteristics seem to be important in the prediction of default. Karlis and Rahmouni (2007:6) used the number of monthly non-payments as a dependent variable to determine the number of defaulters. The largest number they found was 11 and 67.95% of debtors had no default at all.

In order to understand the demographics of debtors in the unsecured market, it would be ideal to obtain a large database of debtors' behaviour over a long period. Working with this data can give an unbiased view of the true default occurrence over the period without the debtor manipulating questions on a questionnaire. The limitation of this approach would be the data captured at the origination of the loan. This would be the only data available and no additional data could be obtained as in the case of questionnaires.

3.2 DATA-COLLECTION METHODOLOGY

The data used in this study comprise five debtor books with similar characteristics. Loans originated between 1999 and 2002. Loan data were collected from the inception of the loans up to December 2012. Demographic and financial data were

consolidated into a Microsoft SQL database, from where the initial data preparation was done.

Data preparation consisted of the following steps:

- Financial transactions were mapped between the different debtor books in order to obtain a uniform transaction list.
- All receipting-related transactions were mapped.
- Journal transactions were mapped in order to distinguish payments, journal transactions and interest transactions.
- A receipting trend database was built per account, which indicated the payment trend over the period. In total, 36 985 354 financial transactions were used in the analysis.
- The receipting database was used to identify the months when a payment was not received per account.
- The number of defaults per account were recorded.
- A second database was built, which contained all the available demographics of the debtors.
- The debtors' database was then populated with the summary data of the receipting database.
- The data were de-normalised in order to facilitate analysis in Microsoft Excel 2013, Access 2013 and Statistica version 12.

Analysis was done of the total population and the individual debtors' books in order to evaluate the inter-book differences.

3.3 RESEARCH RESULTS

The initial phase consists of a total population analysis. This includes a high-level breakdown of the debtor population and a general exploration of the available data. In the second part, the defaulting population is examined in further detail. Multiple defaults are examined in the third portion. A more extensive statistical analysis follows the initial exploration portion, which examines the relationships and correlations between the variables.

3.3.1 Demographics of the total population

	Number of debtors	Number of loans	Original loan amount	Average number of loans	Average loan size	Average loan size per debtor
Book 1	268 067	459 044	R 2 877 585 412.53	1.71	R 6 268.65	R 10 734.58
Book 2	429 575	530 332	R 2 260 261 593.98	1.23	R 4 261.97	R 5 261.62
Book 3	36 559	39 716	R 108 249 703.53	1.09	R 2 725.59	R 2 960.96
Book 4	33 794	39 540	R 166 342 621.20	1.17	R 4 206.95	R 4 922.25
Book 5	14 157	14 164	R 21 539 432.55	1.00	R 1 520.72	R 1 521.47
Total	782 152	1 082 796	R 5 433 978 763.79	1.38	R 5 018.47	R 6 947.47

Table 3.1. Loan characteristics of the total debtors' population.

The total population consists of 1 082 796 loans involving 782 152 individual debtors. This amounts to an average of 1.38 loans per debtor and an average loan size of R5 018.47. The average total loan size is R6 947.47 per debtor.

Book number 1 is the largest regarding loan size. The total amount borrowed in this book is R2 877 585 412.53. The number of loans is lower than that of book number 2, resulting in the highest average loan size of R6 268.65. Book number 5 is the smallest in number of loans and average loan size.

3.3.1.1 Age distribution

Age band	Number of accounts
15 - 20	2 472
21 – 25	62 856
26 – 30	166 163
31 – 35	226 375
36 – 40	221 995
41 – 45	177 796
46 – 50	118 327
51 – 55	68 779
56 – 60	29 320
61 – 65	6 951
66 – 70	1 131
71 – 75	392
76 – 80	174
81 – 85	49
86 – 90	16
Total	**1 082 796**

Table 3.2. Age distribution of debtors.

The predominant age group within the population was between 31 and 35 years of age, with a total of 226 375 loans. The number of younger debtors is expected to be minimal, seeing that most unsecured loans require the debtor to be at least 18 years of age and have a stable income. Debtors aged 36 are the most prominent, with 46 514 loans in this age group. Figure 3.1 below depicts the age distribution of the population.

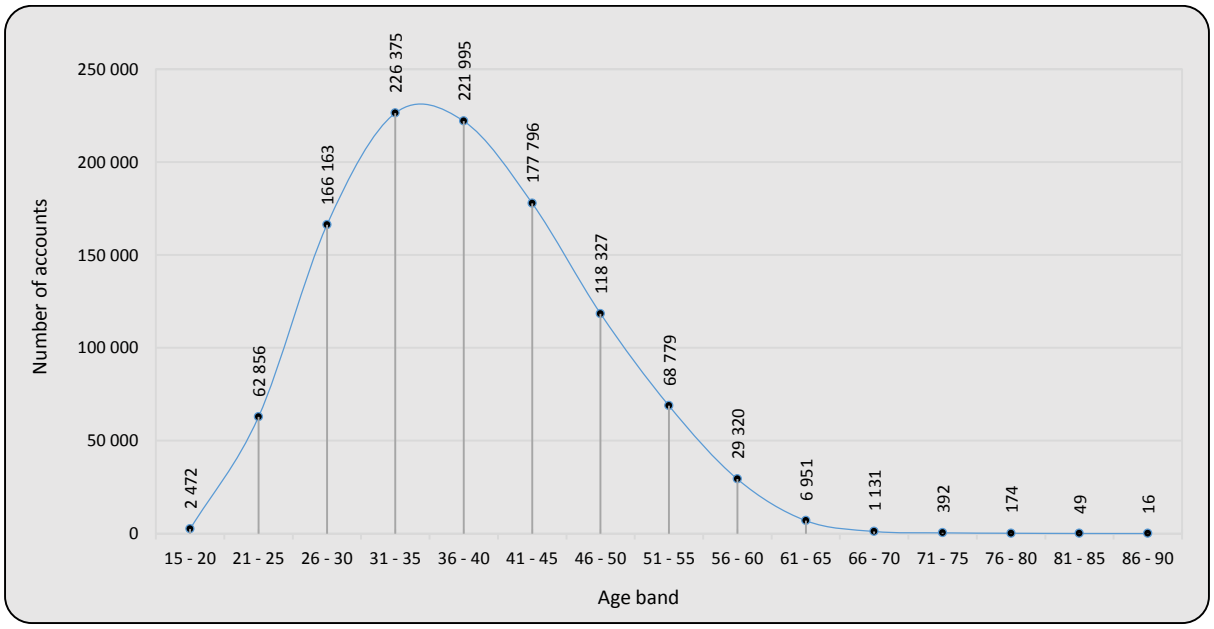

Figure 3.1: Age distribution of the population.

Comparing the age distribution of the five debtors' books, it can be seen that similar age distributions are prevalent in all the books except book 1, where the age distribution is shifted to the left, with a maximum occurrence at the age of 33 versus 36 of the other debtors' books. This shift in age can be seen in figure 3.2 below.

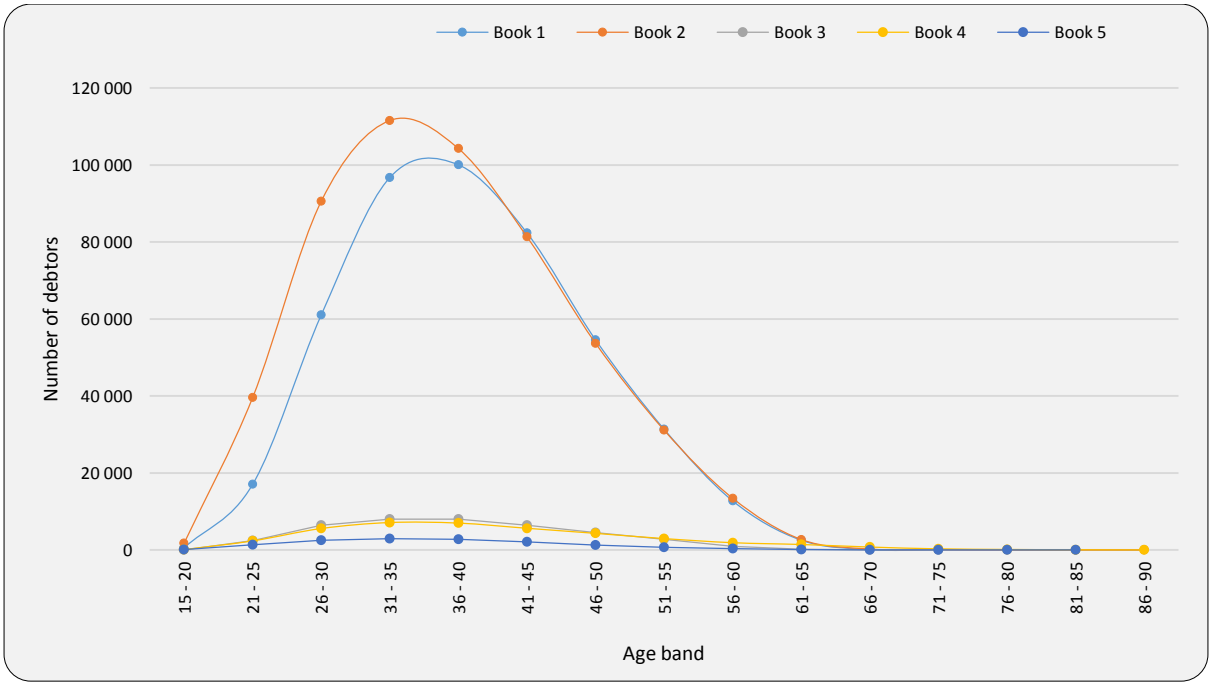

Figure 3.2: Age distribution per debtors' book.

3.3.1.2 Gender distribution

As seen in figure 3.3 below, females are the most prominent debtors in this study accounting for 56% of the loans. From figure 3.4, this trend is the same in the five different debtors' books except in book number 5 where males are slightly more than females.

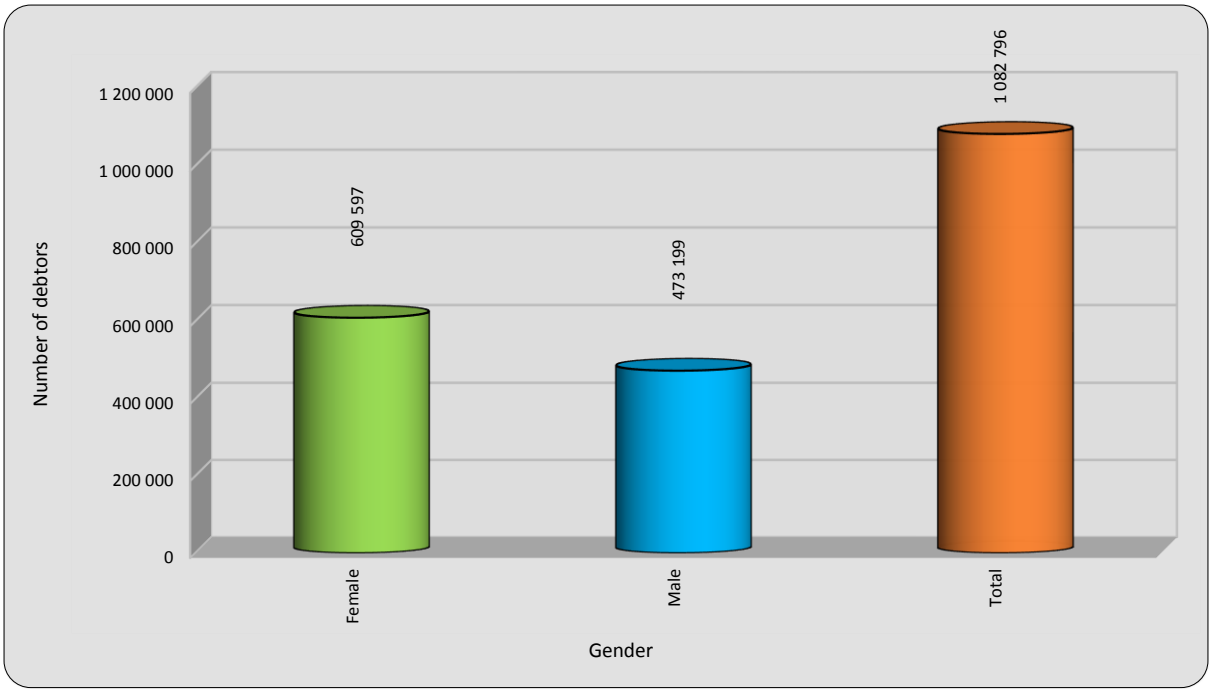

Figure 3.3: Gender distribution of the population.

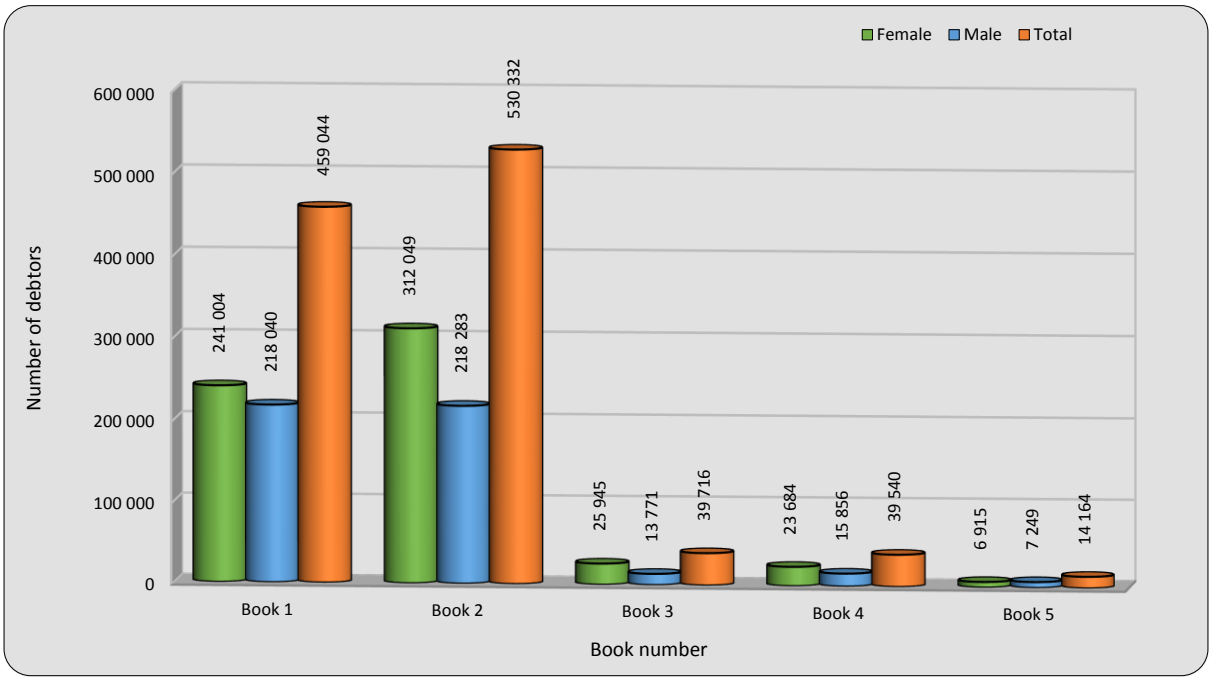

Figure 3.4: Gender distribution per debtors' book.

3.3.1.3 Loan size distribution

From figure 3.5 below it is seen that the most prominent loan size is in the range R0 – R1 500 for the total population. Loans up to R3 000.00 are the most popular and comprise 43% of the total loans book. This same trend is seen in the different debtor books, with loans in the category larger than R12 000.00 being the exception in book number 1 (figure 3.6 below). This is most likely due to the criteria used in the loan application process of book number 1. Loans of this size are usually the exception to the rule in the unsecured loan market.

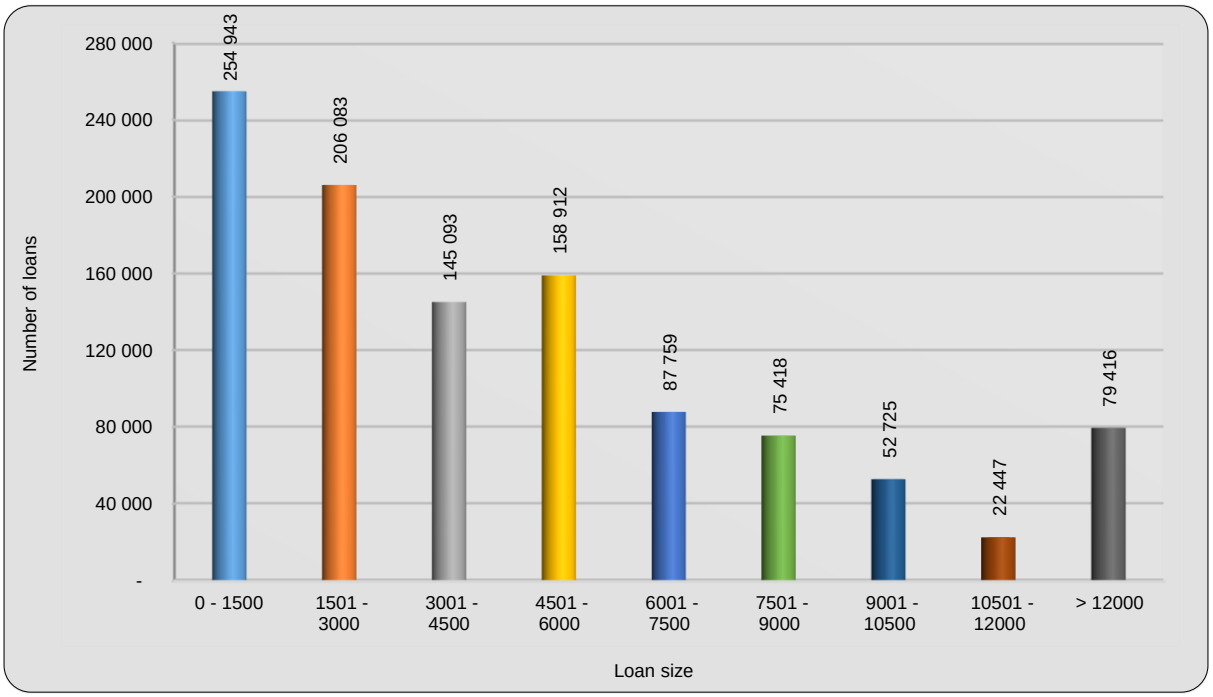

Figure 3.5: Number of loans per loan size.

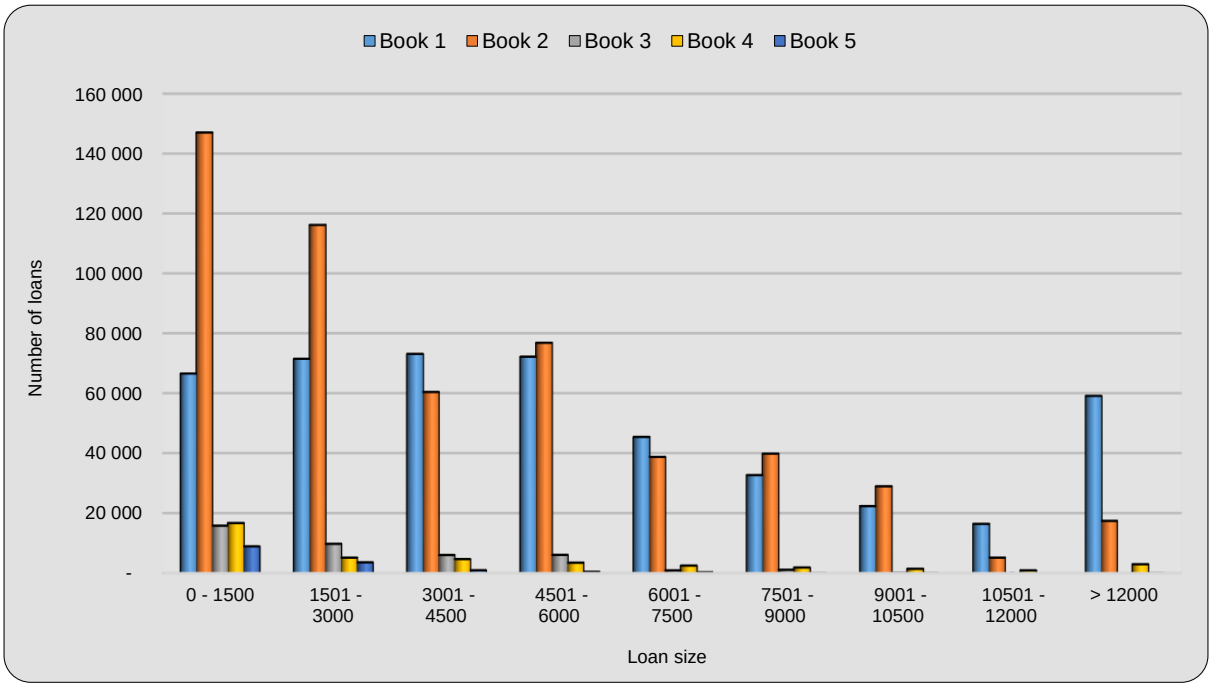

Figure 3.6: Number of loans per loan size per debtors' book.

3.3.1.4 Geographic distribution

Gauteng was the province with most debtors (figure 3.7 below). This is in line with the findings of the NCR (*Consumer Credit Market Report*, 2012:2). The Eastern Cape had the third most debtors, which differs from the results of the NCR. Results from the NCR indicate a higher number of debtors in the Western Cape compared to the Eastern Cape. A similar trend is seen in the different debtor books, except in book number 1, which is much more prominent in the Eastern Cape and Limpopo compared to book number 2 (figure 3.8 below).

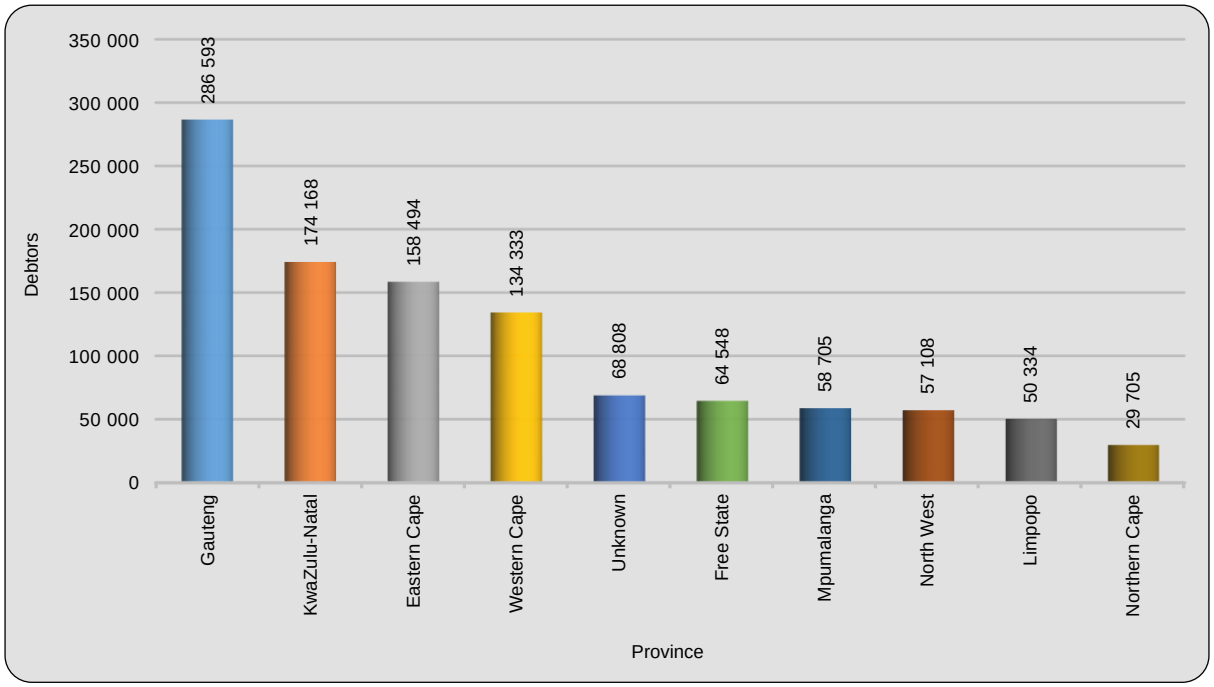

Figure 3.7: Provincial distribution of population.

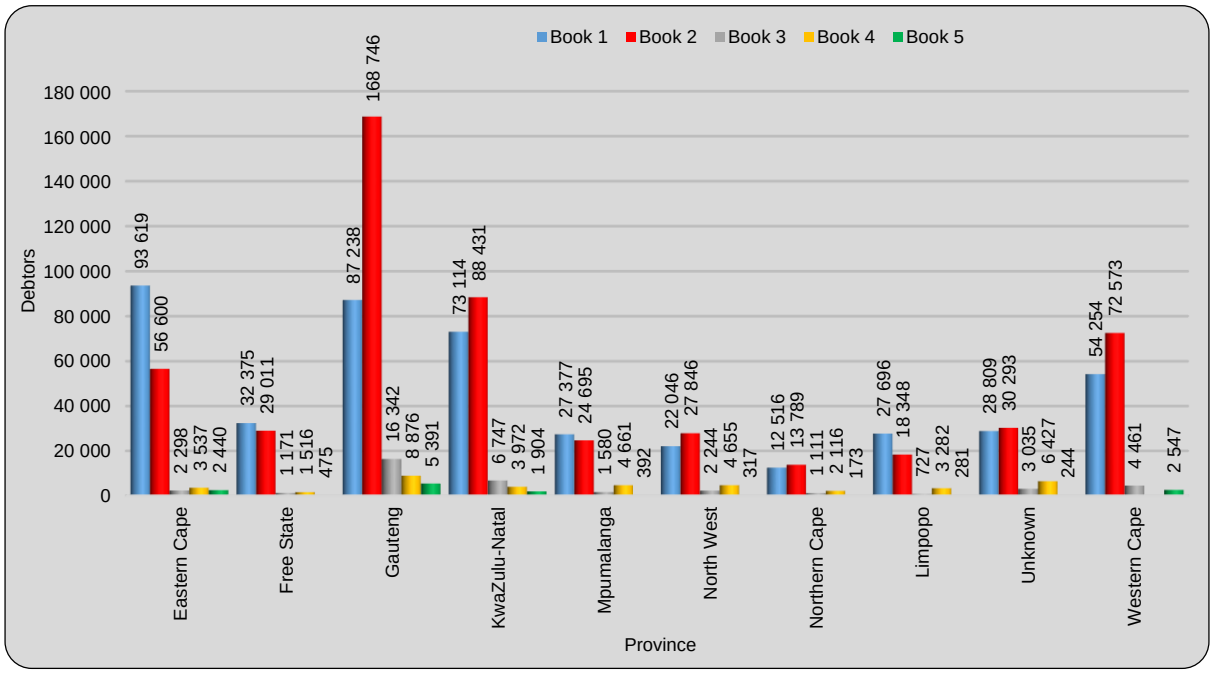

Figure 3.8: Provincial distribution per debtors' book.

3.3.1.5 Number of loans

From figure 3.9 below it is seen that debtors in general have more than one loan. Having more than 10 loans is probably not the norm and this number may be due to debtors experiencing extreme circumstances. It may also be that debtors pay one loan by taking out another. More than 80% of the debtors had between one and three loans in total (table 3.3 below). Debtors with more than six loans are the exception and this can be expected in the unsecured loan market where these debtors will be a high risk for micro-lenders.

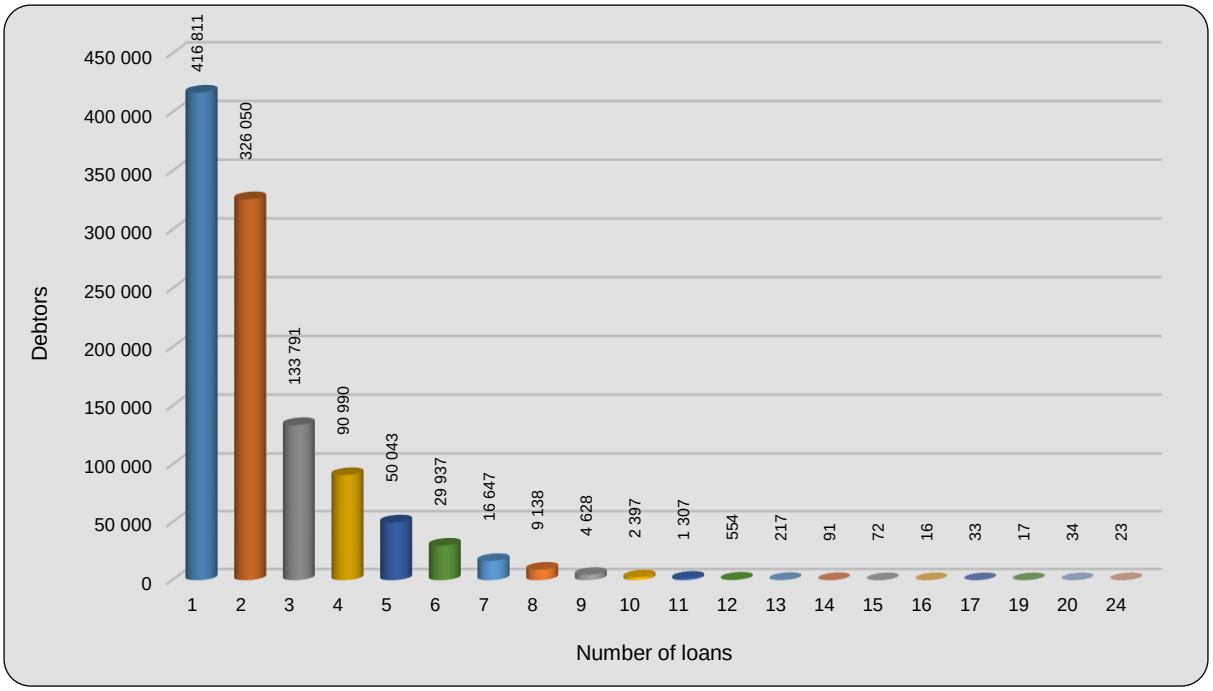

Figure 3.9: Number of loans per debtor for the population.

No of loans	1	2	3	4	5	6	7	8	9	10	11
Book 1	109 126	121 267	77 118	63 270	36 837	23 068	13 180	7 383	3 797	2 001	1 081
Book 2	249 713	183 443	48 867	24 269	11 814	6 014	3 116	1 583	737	359	202
Book 3	21 669	9 958	4 785	1 779	811	358	170	94	48	25	10
Book 4	23 066	10 695	2 879	1 615	556	398	176	76	46	12	14
Book 5	13 237	687	142	57	25	9	5	2	0	0	0
Total	**416 811**	**326 050**	**133 791**	**90 990**	**50 043**	**29 937**	**16 647**	**9 138**	**4 628**	**2 397**	**1 307**

No of loans	12	13	14	15	16	17	19	20	24	Total
Book 1	467	189	78	63	14	31	17	34	23	459 044
Book 2	73	28	13	7	2	2	0	0	0	530 332
Book 3	7	0	0	2	0	0	0	0	0	39 716
Book 4	7	0	0	0	0	0	0	0	0	39 450
Book 5	0	0	0	0	0	0	0	0	0	14 164
Total	**554**	**217**	**91**	**72**	**16**	**33**	**17**	**34**	**23**	**1 082 796**

Table 3.3. Number of loans per debtor book.

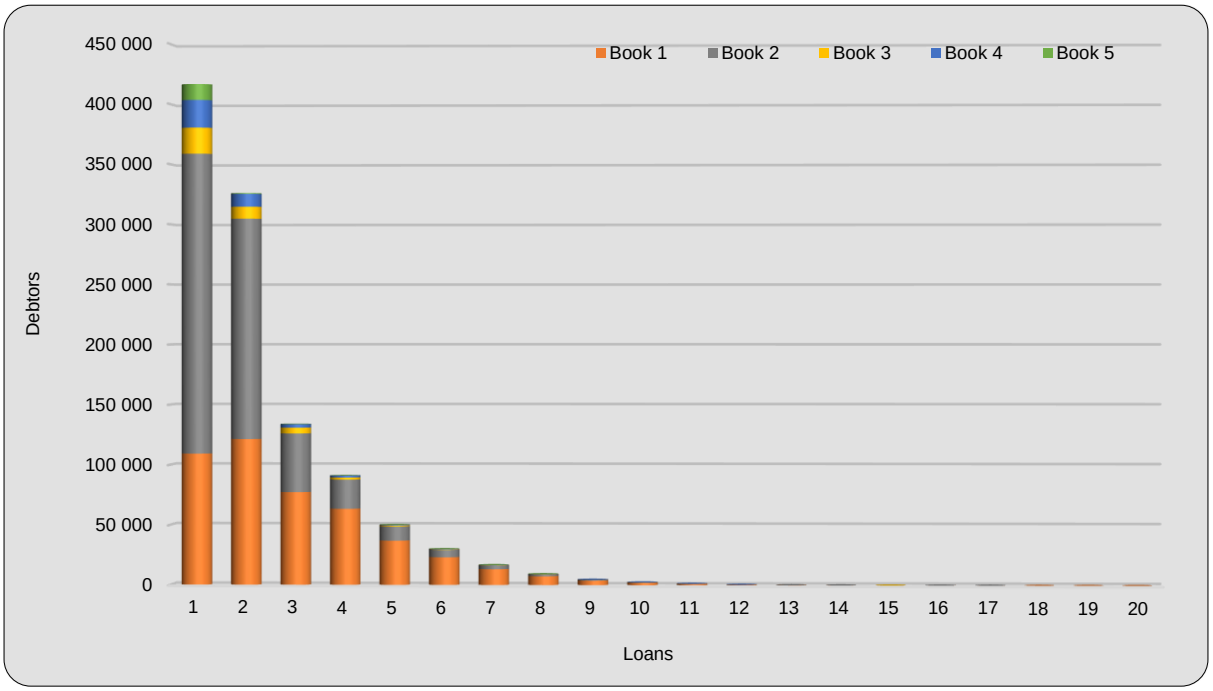

Figure 3.10: Number of loans per debtor per debtors' book.

Debtors of book number 2 are most prominent in the double loan category versus the other four books. As seen in figure 3.8 and figure 3.10 above, debtors are granted more loans and higher amounts in book number 1. The management of this book seems to tolerate a higher risk profile than the other four debtor books.

No of loans	1	2	3	4	5	6	7	8	9	10	11
Book 1	23.77	26.42	16.80	13.78	8.02	5.03	2.87	1.61	0.83	0.44	0.24
Book 2	47.09	34.59	9.21	4.58	2.23	1.15	0.59	0.30	0.14	0.07	0.04
Book 3	54.56	25.07	12.05	4.48	2.04	0.90	0.43	0.24	0.12	0.06	0.03
Book 4	58.34	27.05	7.28	4.08	1.41	1.01	0.45	0.19	0.12	0.03	0.04
Book 5	93.46	4.85	1.00	0.40	0.18	0.06	0.04	0.01	0.00	0.00	0.00
Total	**38.49**	**30.11**	**12.36**	**8.40**	**4.62**	**2.76**	**1.54**	**0.84**	**0.43**	**0.22**	**0.12**

No of loans	12	13	14	15	16	17	19	20	24
Book 1	0.10	0.04	0.02	0.01	0.00	0.01	0.00	0.01	0.01
Book 2	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Book 3	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Book 4	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Book 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**0.05**	**0.02**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Table 3.4. Percentage of loans per book per number of loans.

Age	36
Gender	Female
Loan amount	R 3000.00
Province	Gauteng
Number of loans	1

Per book	Age	Gender	Loan amount	Province	Number of loans
Book 1	36	Female	R4 719.90	Eastern Cape	2
Book 2	33	Female	R3 000.00	Gauteng	1
Book 3	37	Female	R5 000.00	Gauteng	1
Book 4	37	Female	R200.00	Gauteng	1
Book 5	32	Male	R1 000.00	Gauteng	1

Table 3.5. Profile of the average debtor.

Table 3.5 above depicts the ultimate profile of a debtor in this study. This debtor is a 36-year-old female residing in Gauteng, taking a single R3 000 loan.

3.3.2 Demographics of debtor defaulters

Defaulters	Debtors	Accounts	Value	% Debtors	% Accounts	% Value
Book 1	227 472	347 259	R 2 275 361 406.01	84.86	75.65	79.07
Book 2	391 654	453 707	R 1 981 869 131.42	91.17	85.55	87.68
Book 3	29 757	31 814	R 88 581 325.92	81.39	80.10	81.83
Book 4	33 591	39 166	R 165 620 863.62	99.40	99.05	99.57
Book 5	14 062	14 066	R 21 386 710.69	99.33	99.31	99.29
Total	**696 536**		**R 4 532 819 437.66**	**89.05**	**81.83**	**83.42**

Table 3.6. Defaulters: Debtors, accounts and value.

A total number of 696 536 debtors defaulted on their loans within the period (table 3.6 above). This amounted to 886 012 loans, or 81.83% of the total number of loans. Looking at defaulting debtors, this percentage amounts to 89.05% of the debtor population. Of the total value of the initial loans, 83.42% defaulted. Book number 4 and book number 5 had an almost complete default rate.

	Count	% paid off
Paid off without any default	167 156	29.14
Paid off with default	406 414	70.86
Paid off	**573 570**	**100**

Table 3.7. Paid off accounts.

Paid off accounts			
Book	**Defaulter**	**Count**	**% of total loans**
1	N	97 972	58.61
2	N	60 937	36.46
3	N	7 885	4.72
4	N	265	0.16
5	N	97	0.06
Total		**167 156**	**15.44**
1	Y	161 240	39.67
2	Y	216 114	53.18
3	Y	21 779	5.36
4	Y	4 758	1.17
5	Y	2 523	0.62
Total		**406 414**	**37.53**

Table 3.8. Paid up accounts per debtors' book.

Only 53% of all loans were paid off over the ten-year period; 15% paid off their loans without any default. From table 3.8 above it is seen that the 58.61% of the loans paid off without any default were in debtor book number 1. This is also the book with the largest number of high-value loans in the study.

3.3.2.1 Age distribution of defaulters

Figure 3.1 and 3.13 indicate a similar distribution of the debtors' population versus the defaulting population. In both instances, the most prominent age band is between 31 and 40 years of age. The distribution curve looks similar for both populations.

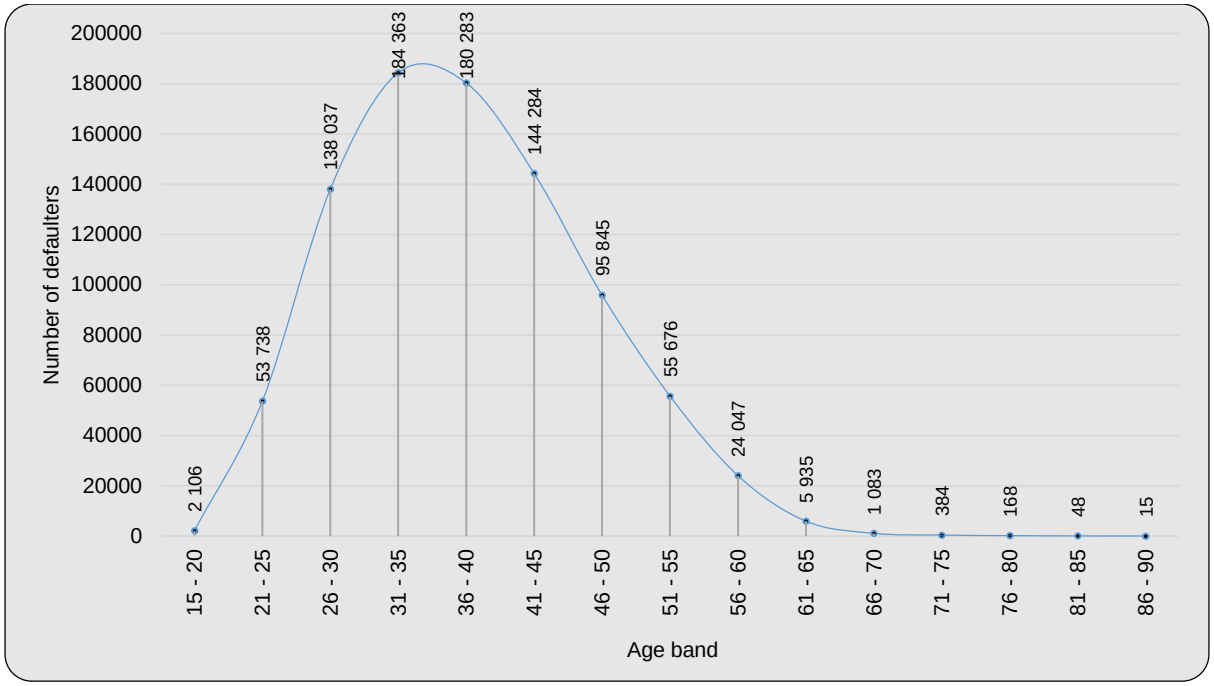

Figure 3.11: Age band of defaulters.

From figure 3.2 and figure 3.12 it is seen that the age distribution for the debtors' population per book and the defaulting population per book follows the same pattern.

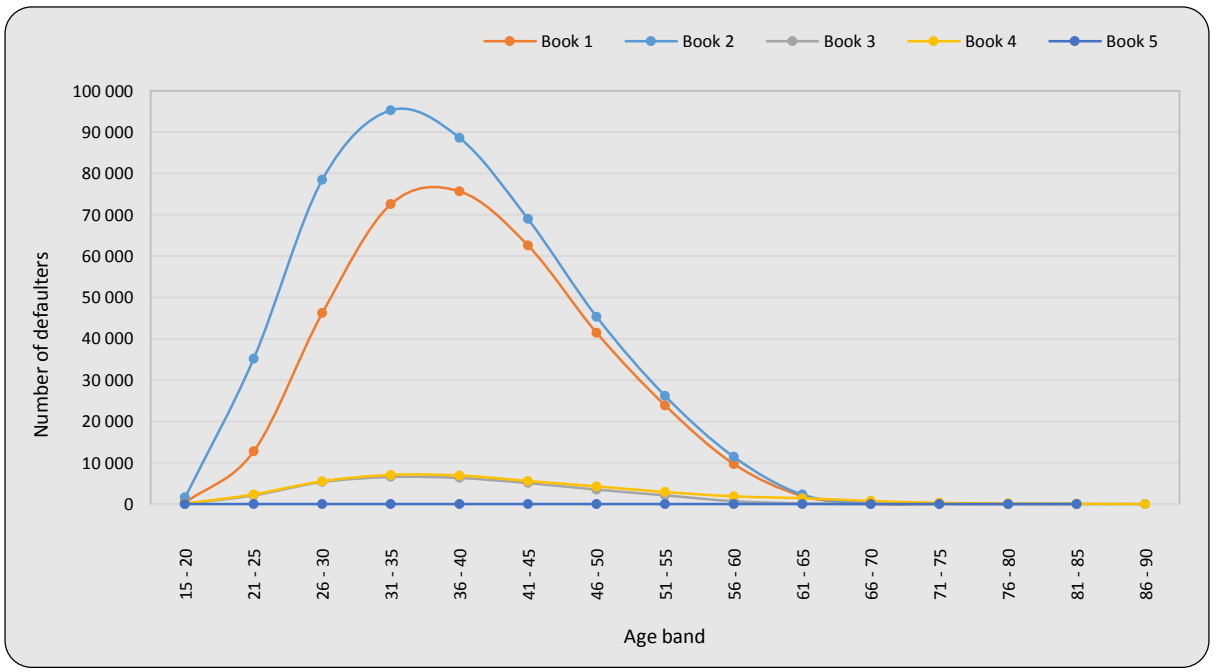

Figure 3.12: Age distribution of defaulters per debtors' book.

3.3.2.2 Gender distribution of defaulters

When comparing figure 3.1 and 3.13, it is seen that the gender distribution for the total debtor's population and the defaulting population are the same. Females comprise 56% of both of these populations. Considering gender as a variable, it seems as if the percentage of females that take up loans and those that become defaulters is the same. The same distribution pattern can be seen when comparing gender in the debtor population and the defaulting population per debtor book (figure 3.4 and figure 3.13).

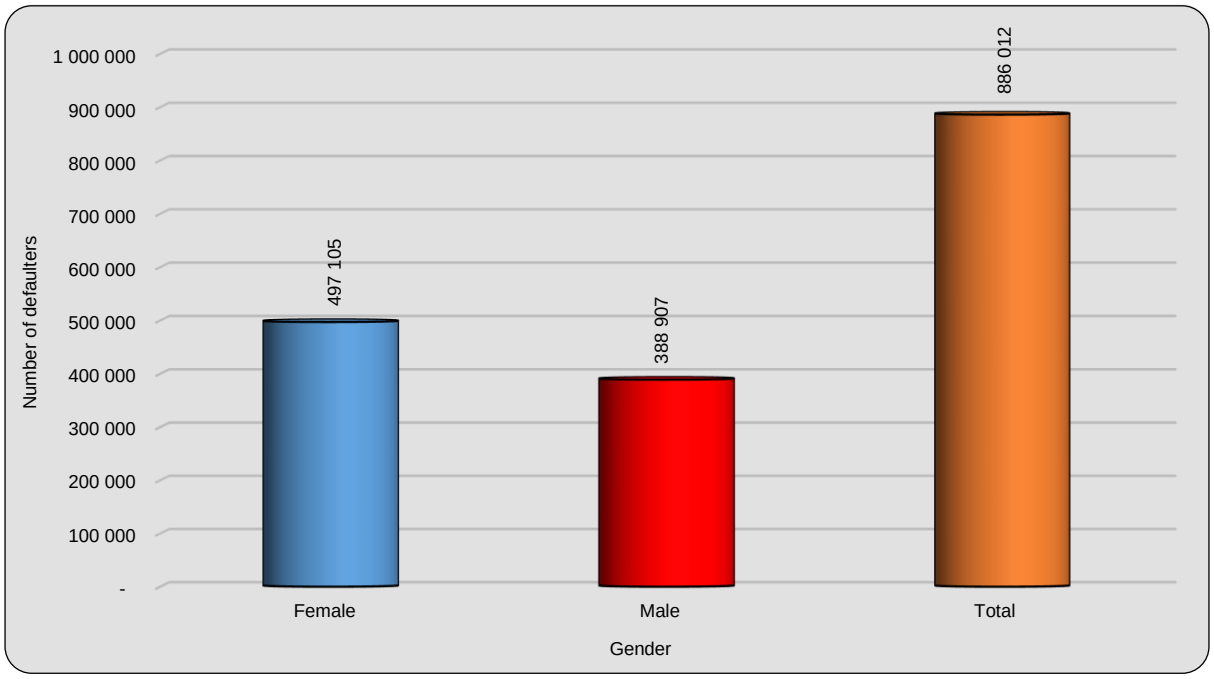

Figure 3.13: Number of defaults per gender.

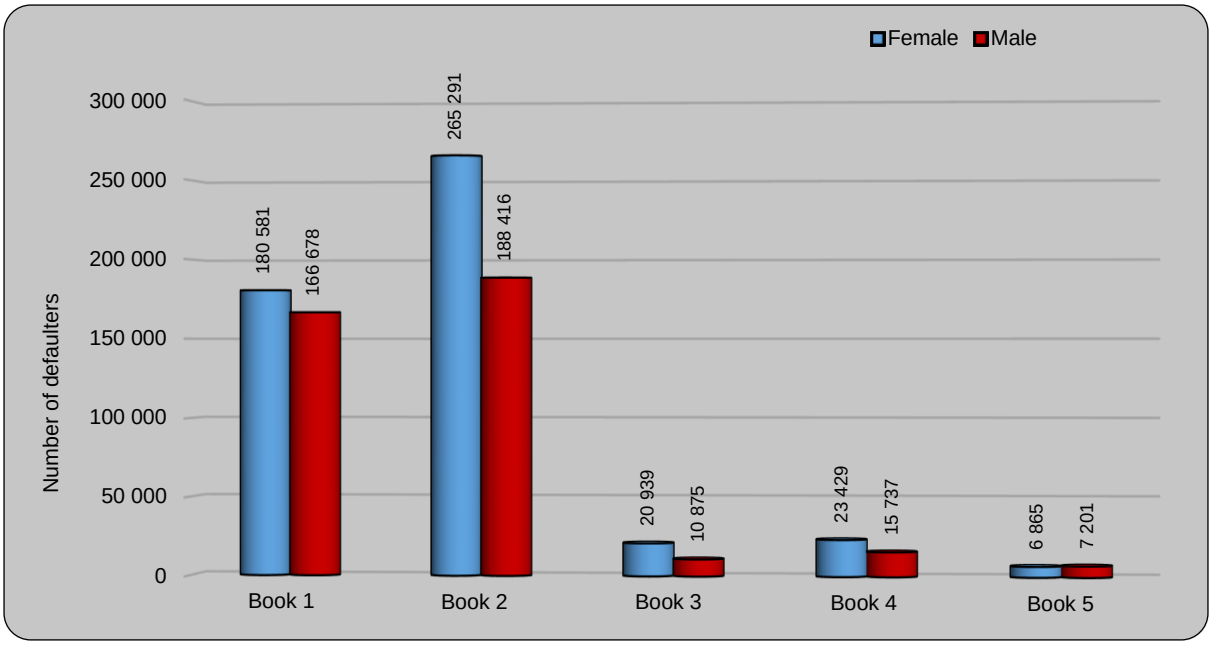

Figure 3.14: Number of defaults per gender per debtors' book.

3.3.2.3 Loan size distribution of defaulters

The loan size distribution per debtor's population is the same in the defaulting population, as seen in figures 3.5 and 3.15. The majority of the loans are within the zero to R3 000.00 loan size bracket in both populations. Comparing figures 3.6 and 3.16, the same distribution can be seen in the different debtors' books. Defaulters in the R3 001.00 to R4 500.00 and R6 001.00 to R7 500.00 brackets for book number 1 is higher than in the debtors population.

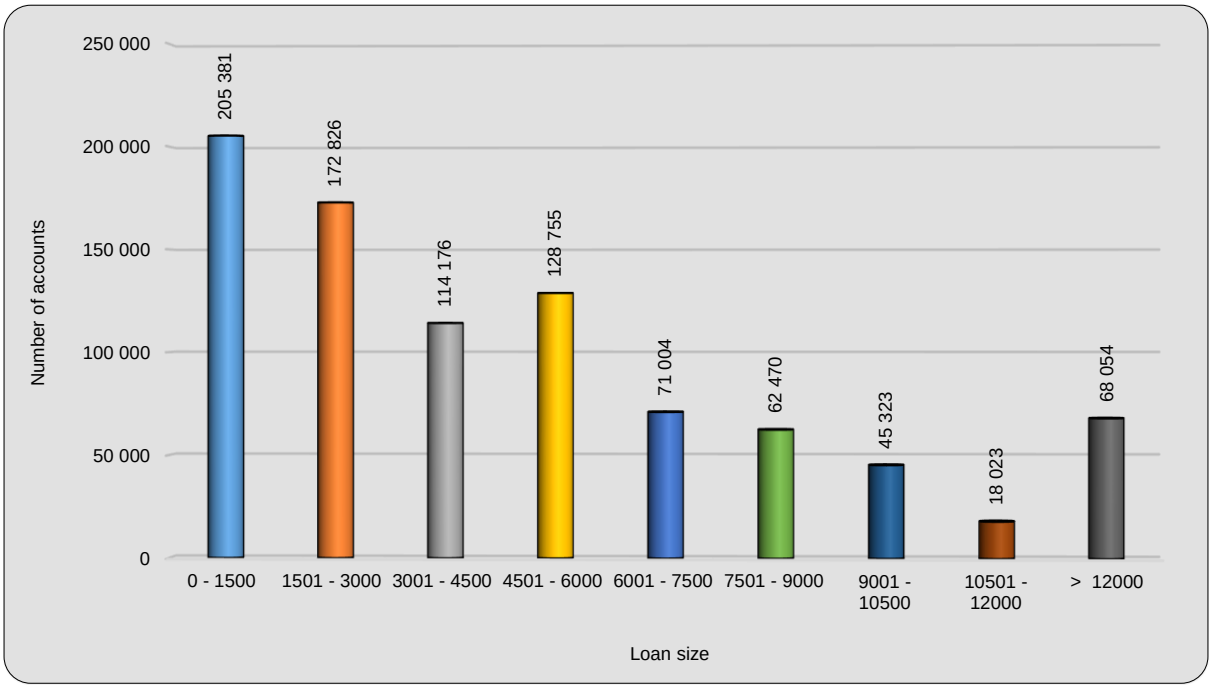

Figure 3.15: Number of loans per loan size (defaulters).

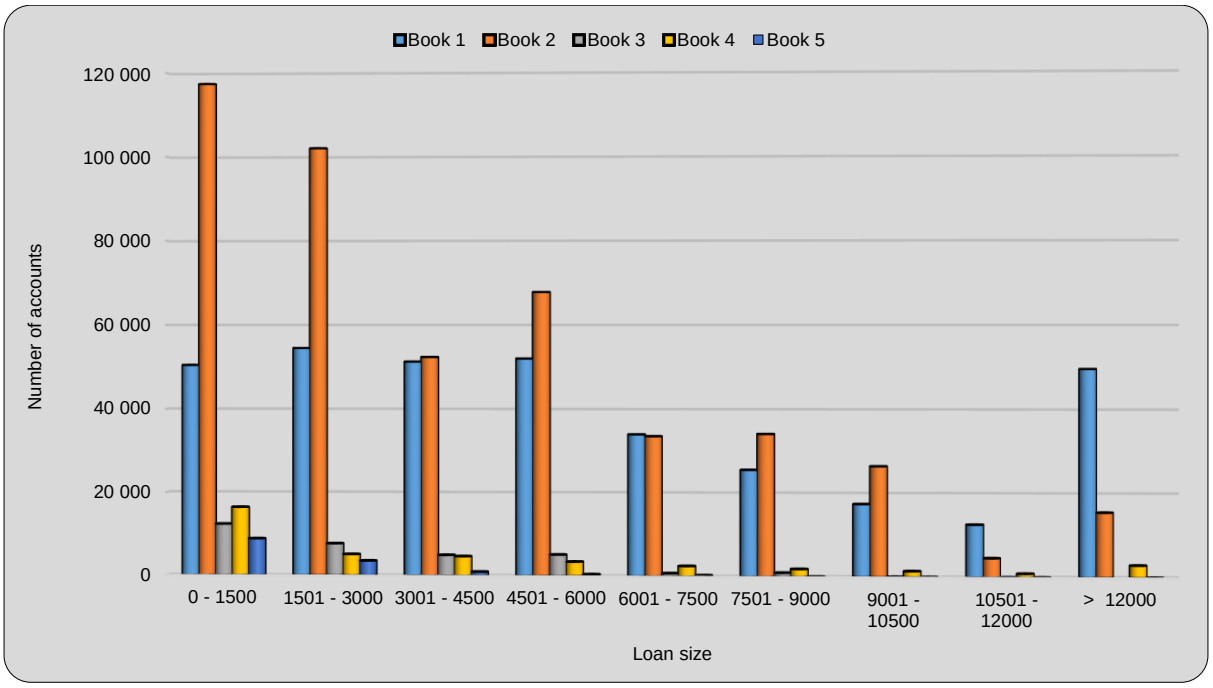

Figure 3.16: Number of loans per loan size per debtors' book (defaulters).

3.3.2.4 Geographic distribution of defaulters

Comparing figure 3.7 and 3.17, it is seen that the geographic distribution of the debtors' population and that of defaulters follow the same pattern. Gauteng is the province with most debtors and the highest defaulting population, with KwaZulu-Natal second most prominent. Similar profiles per debtors' book are observed (figure 3.8 and figure 3.18). Similar to previous variables, the trend of the debtors' profile becoming the defaulting profile is evident, as seen in the geographic distribution.

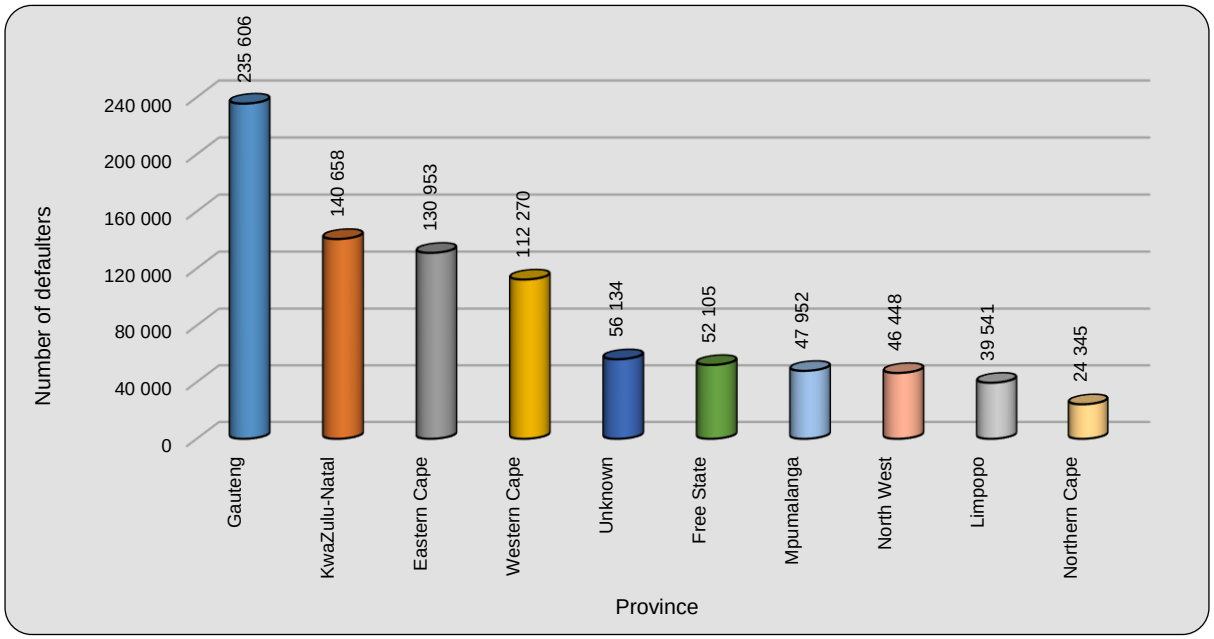

Figure 3.17: Defaulters per province.

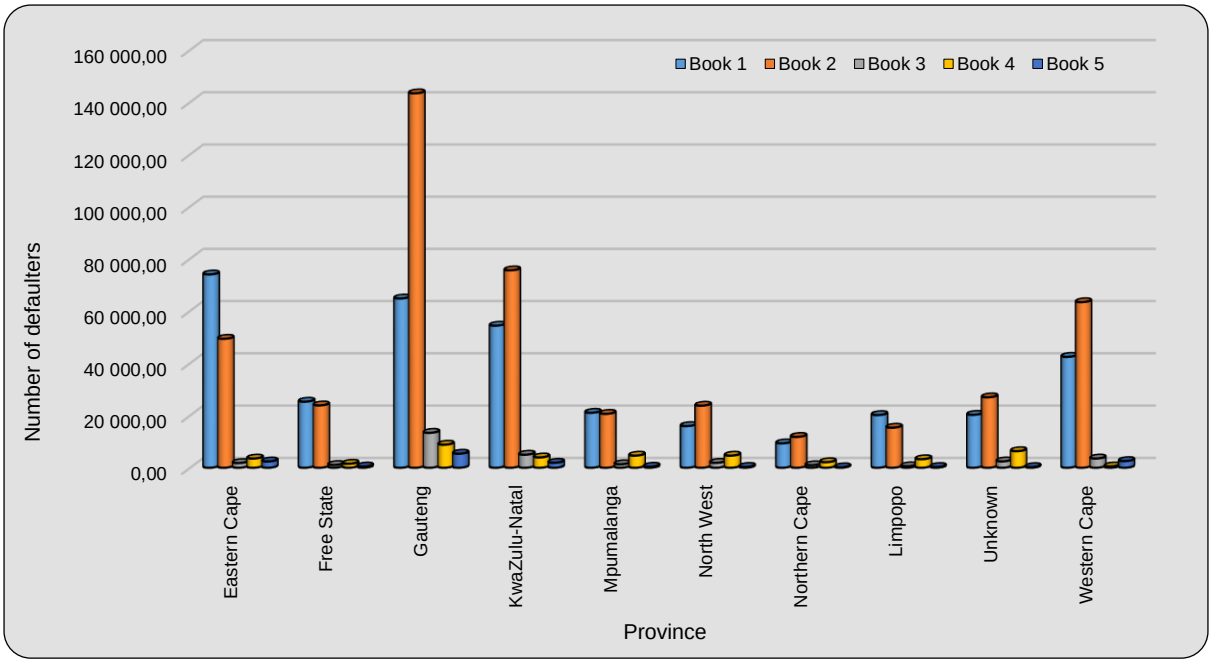

Figure 3.18: Defaulters per province per debtors' book.

3.3.2.5 Number of loans per defaulter

Comparing figure 3.9 and 3.19, similar distributions of the debtors' population and the defaulting population are seen. Figures 3.10 and 3.20 exhibit the same trend when the number of loans are compared within the debtors population and the defaulter population.

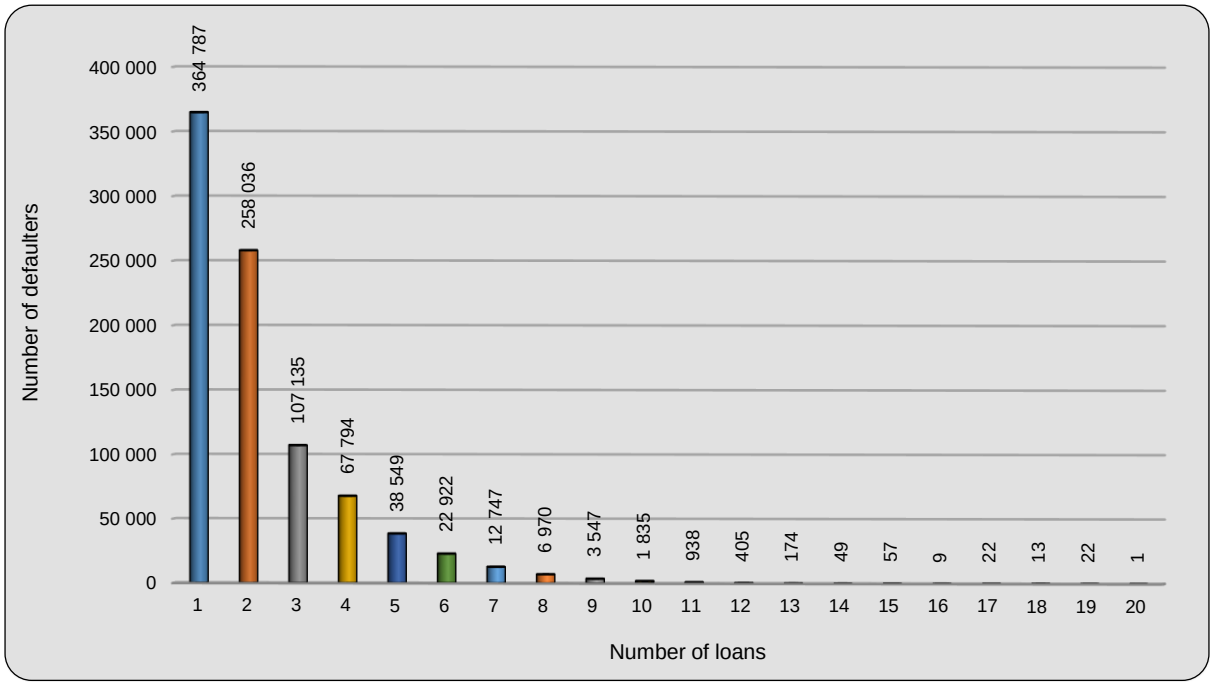

Figure 3.19: Number of loans per defaulter.

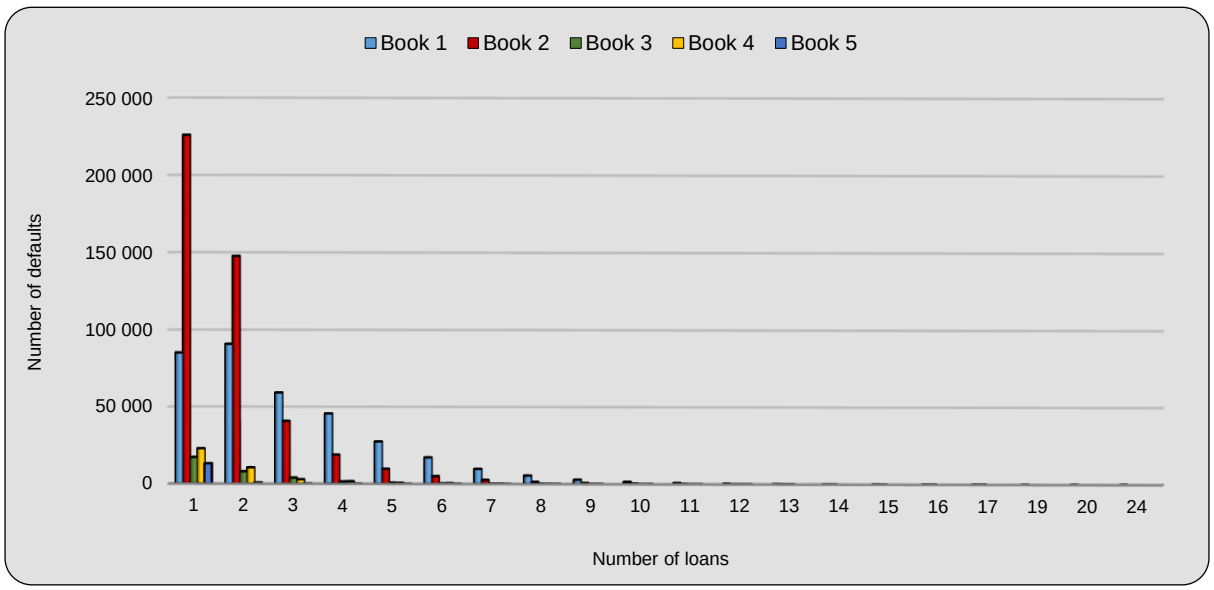

Figure 3.20: Number of defaults per number of loans per debtors' book.

Age	36
Gender	Female
Loan amount	R 3000.00
Province	Gauteng
Number of loans	1

Per book	Age	Gender	Loan amount	Province	Number of loans
Book 1	38	Female	R 4 719.90	Eastern Cape	2
Book 2	33	Female	R 3 000.00	Gauteng	1
Book 3	37	Female	R 5 000.00	Gauteng	1
Book 4	37	Female	R 200.00	Gauteng	1
Book 5	32	Male	R 1 000.00	Gauteng	1

Table 3.9. Profile of the average debtor defaulter.

It is seen that the average debt defaulter is a 36-year-old female residing in Gauteng, taking a single loan of R3 000.

3.3.3 Multiple defaults

3.3.3.1 Age distribution of multiple defaulters

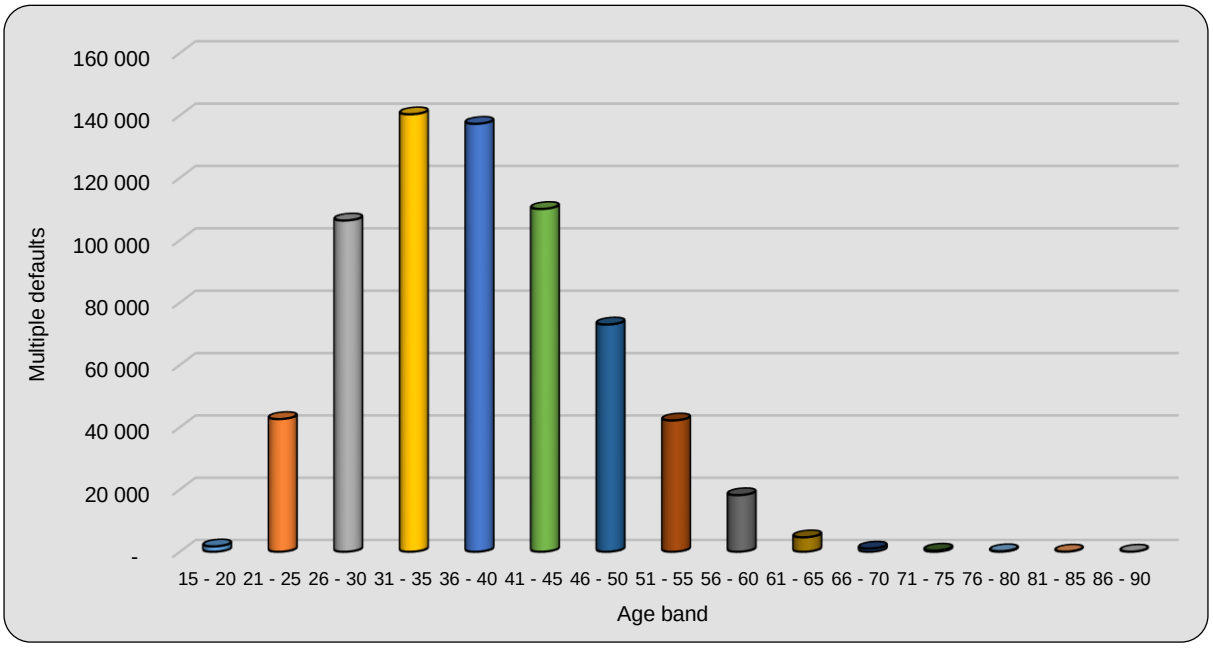

Figure 3.21: Number of multiple defaults per age band.

Comparing figures 3.1, 3.11 and 3.21, it is seen that the age distribution for debtors, defaulters and multiple defaulters follow the same distribution.

3.3.3.2 Gender distribution of multiple defaulters

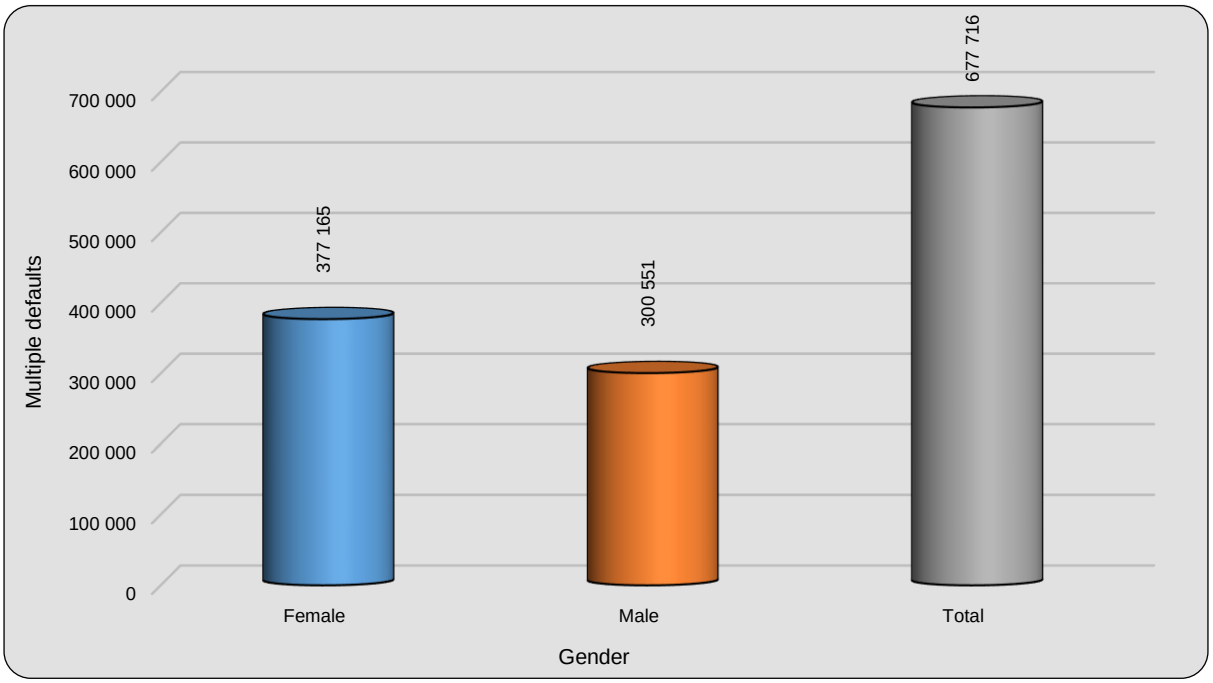

Figure 3.22: Multiple defaults per gender.

Comparing figures 3.3, 3.13 and 3.22, it can be seen that the gender distribution of debtors, defaulters and multiple defaulters is the same. Females comprise 56% of debtors, defaulters and multiple defaulters.

3.3.3.3 Geographic distribution of multiple defaulters

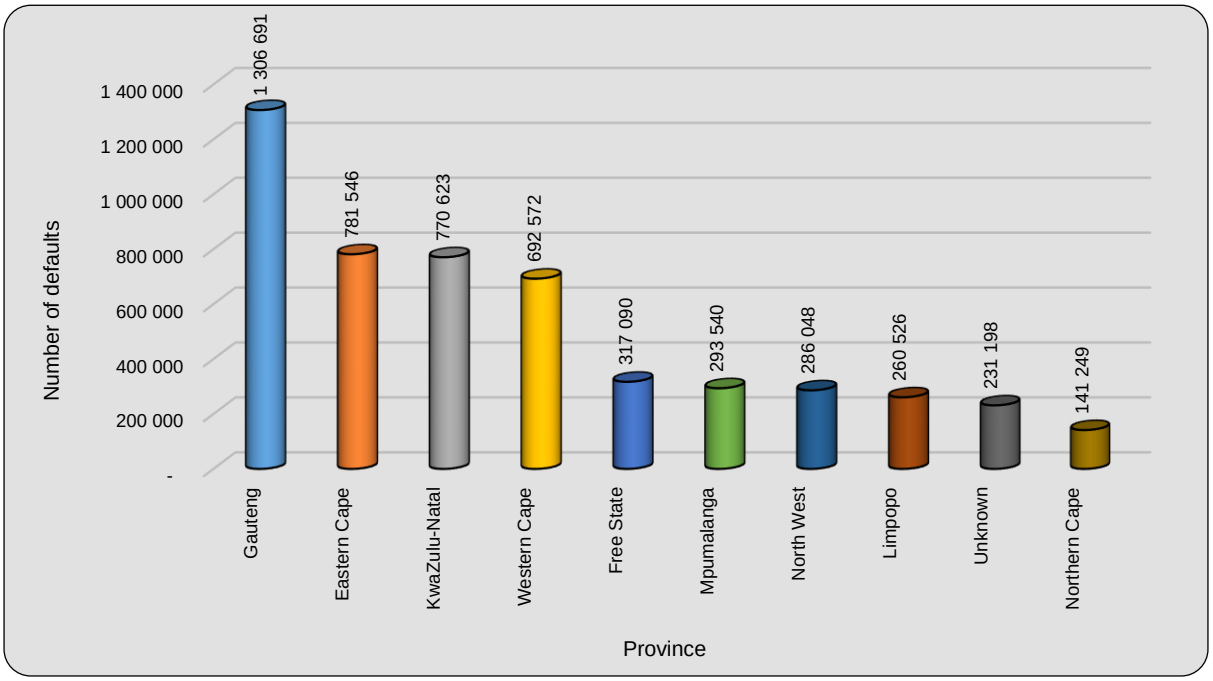

Figure 3.23: Multiple defaults per province.

Comparing figures 3.7, 3.17 and 3.23, it is seen that the geographic distribution between debtors, defaulters and multiple defaulters is also similar. Gauteng, followed by KwaZulu-Natal and then the Eastern Cape, is most prominent. The multiple defaulter population in the Eastern Cape is slightly larger than that in KwaZulu-Natal.

3.3.4 Non-defaulters

Non-defaulters	Debtors	Accounts	Value	% Debtors	% Accounts	% Value
Book 1	40 595	111 785	R 602 224 006.52	15.14	24.35	20.93
Book 2	37 921	76 625	R 278 392 462.56	8.83	14.45	12.32
Book 3	6 802	7 902	R 19 668 377.61	18.61	19.90	18.17
Book 4	203	374	R 721 757.58	0.60	0.95	0.43
Book 5	95	98	R 152 721.86	0.67	0.69	0.71
Total	**85 616**	**196 784**	**R 901 159 326.13**	**10.95**	**18.17**	**16.58**

Table 3.10. Non-defaulters: Debtors, accounts and value.

Age	36
Gender	Female
Loan amount	R400.00
Province	Gauteng
Number of loans	2

Per book	Age	Gender	Loan amount	Province	Number of loans
Book 1	35	Female	R400.00	Eastern Cape	2
Book 2	37	Female	R400.00	Gauteng	2
Book 3	37	Female	R3 000.00	Gauteng	1
Book 4	31	Female	R200.00	Gauteng	2
Book 5	27	Female	R200.00	Gauteng	1

Table 3.11. Profile of the average non-debt defaulter.

The average non-defaulter is a 36-year-old female residing in Gauteng, taking two loans valued at R400.

When comparing tables 3.4, 3.8 and 3.10, it can be seen that the ages of debtors, defaulters and non-defaulters are on average the same. The loan amount is the same for debtors and defaulters, but substantially smaller for non-defaulters. On average non-defaulters make more loans than defaulters do. Females are on average the most prominent debtors, defaulters and non-defaulters. Most debtors, defaulters and non-defaulters are from Gauteng. Debtors and defaulters do not vary substantially between the different debtor books. For book 1, the average age is higher than in the other books and compared to all debtors. On average non-defaulters seem to make smaller loans than the defaulting or debtors' population. This might be an indication that non-defaulters use loans to pay off other loans or that the smaller amounts borrowed are more manageable to repay than larger loans. A typical defaulter's profile seems to be the same as that of the average debtor, with no specific variable distinguishing a typical defaulter, as investigated in this study.

3.4. STATISTICAL ANALYSIS

The data obtained in the study were first analysed for general statistical trends and characteristics. Variables were then further explored to investigate the possibility of

statistically significant relationships. Decision trees were created to obtain the profile of the ultimate defaulter.

3.4.1 General exploratory analysis

A correlation matrix was created to investigate the correlations between the variables under investigation.

	Loan amount	Number of loans	Sum of loans	Default count	Age
Loan amount	1.0000	0.1332	0.5432	0.0402	0.0108
	p = --	p = 0.00	p = 0.00	p = 0.00	p = 0.00
Number of loans	0.1332	1.0000	0.7300	0.0429	0.0609
	p = 0.00	p = --	p = 0.00	p = 0.00	p = 0.00
Sum of loans	0.5432	0.7300	1.0000	0.0254	0.0298
	p = 0.00	p = 0.00	p = --	p = 0.00	p = 0.00
Default count	0.0402	0.0429	0.0254	1.0000	-0.0074
	p = 0.00	p = 0.00	p = 0.00	p = --	p = 0.00
Age	0.0108	0.0609	0.0298	-0.0074	1.0000
	p = 0.00	p = 0.00	p = 0.00	p = 0.00	p = --

Table 3.12. Correlation matrix.

From the correlation matrix, it is seen that there is a strong relationship between the loan amount and the sum of loans, which is to be expected. The relationship between the loan amount and the default count is weak. The correlation between the number of loans and the sum of loans is also strong. All three these relationships are statistically significant.

	Valid N	Mean	Sum	Minimum	Maximum	Variance	STD. Dev	Coef. Var.	Standard (Error)	Skewness	Kurtosis
Loan Amount											
All	1 08 2796	R 5018.47	R 5 433 978 762.01	R 149.00	R 135 550.59	R 23 541 619.89	4 851.97	96.68	4.66	2.69	15.76
Non-defaulters	196 784	R 4579.43	R 901 159 326.12	R 149.00	R 130 509.02	R 16 592 793.66	4 073.43	88.95	9.18	2.30	18.21
Defaulters	886 012	R 5 115.98	R 4 532 819 435.89	R 149.00	R 135 550.59	R 25 032 661.69	5 003.27	97.80	5.32	2.70	15.09
Book 1	347 259	R 6 552.35	R 2 275 361 404.26	R 149.23	R 93 569.42	R 37 603 525.91	6 132.17	93.59	10.41	2.39	9.48
Book 2	453 707	R 4368.17	R 1 981 896 131.40	R 149.00	R 135 550.59	R 14 074 651.39	3 751.62	85.89	5.57	2.07	19.80
Book 3	31 814	R 2 784.35	R 88 581 325.92	R 151.47	R 12 094.43	R 4 356 250.88	2 087.16	74.96	11.70	0.87	0.12
Book 4	39 166	R 4 228.69	R 165 620 863.62	R 149.00	R 83 627.90	R 30 783 001.82	5 548.24	131.20	28.04	3.18	18.15
Book 5	14 066	R 1 520.45	R 21 386 710.69	R 149.00	R 47 848.00	R 2 511 875.15	1 584.89	104.24	13.36	4.29	70.21
Number of Loans											
All	1 08 2796	2.35	2 547 908	1	24	3	1.69	71.73	0.00	1.93	5.45
Non-defaulters	196 784	2.69	528 719	1	24	3	1.80	66.96	0.00	1.85	6.25
Defaulters	886 012	2.28	2 019 189	1	24	3	1.65	72.53	0.00	1.96	5.19
Book 1	347 259	2.99	1 038 839	1	24	4	1.96	65.38	0.00	1.38	2.68
Book 2	453 707	1.85	840 111	1	17	2	1.23	66.65	0.00	2.47	8.87
Book 3	31 814	1.83	58 351	1	15	2	1.24	67.84	0.01	2.33	8.21
Book 4	39 166	1.70	66 521	1	12	1	1.15	67.50	0.01	2.64	9.95
Book 5	14 066	1.09	15 367	1	8	0	0.42	38.44	0.00	6.65	59.60
Sum of Loans											
All	1 082 796	R 12 270.97	R 13 286 959 523.22	R 149.00	R 183 649.70	R 1886 262 923.75	13 647.82	111.22	13.12	2.60	10.15
Non-defaulters	196 784	R 13 837.18	R 2 722 934 646.27	R 149.00	R 183 649.70	R 188 719 993.02	13 737.54	99.28	30.97	2.45	9.26
Defaulters	886 012	R 11 923.12	R 10 564 024 876.95	R 149.00	R 183 649.70	R 185 051 603.74	13 603.37	114.09	14.45	2.65	10.44
Book 1	347 259	R 17 648.41	R 6 128 568 414.25	R 149.62	R 183 649.70	R 274 843 392.34	16 578.40	93.94	28.13	2.04	6.03
Book 2	453 707	R 8 634.74	R 3 917 640 441.48	R 149.00	R 175 371.02	R 94 469 466.42	9 719.54	112.56	14.43	3.20	17.45
Book 3	31 814	R 6 655.51	R 211 738 503.33	R 151.47	R 134 635.45	R 78 840 121.75	8 879.20	133.41	49.78	4.09	26.10
Book 4	39 166	R 7 121.77	R 278 931 400.93	R 150.00	R 146 394 47	R 89 952 652.46	9 484.34	133.17	47.92	3.29	18.40
Book 5	14 066	R 1 929.91	R 27 146 116.96	R 149.00	R 104 575.02	R 10 268 325.72	3 204.42	166.04	27.02	9.21	162.82
Default Count											
All	1 082 796	4.85	5 081 083	0	67	43	6.55	135.13	0.01	2.67	8.73
Non-defaulters	196 784	0	0	0	0	0	0	0	0.00	0	0
Defaulters	886 012	5.73	8 081 083	1	67	46	6.76	117.81	0.01	2.55	7.75
Book 1	347 259	5.51	1 913 634	1	54	48	6.93	125.75	0.01	2.64	7.73
Book 2	453 707	5.68	2 575 363	1	67	46	6.75	118.86	0.01	2.62	8.35
Book 3	31 814	4.46	141 816	1	51	29	5.38	120.76	0.03	3.48	15.34
Book 4	39 166	7.58	296 870	1	52	20	4.49	59.27	0.02	1.50	5.29
Book 5	14 066	10.91	153 400	1	40	58	7.65	70.12	0.06	0.64	-0.40
Age											
All	1 082 796	38.11	41 267 893	15	90	79	8.87	23.26	0.01	0.43	-0.20
Non-defaulters	196 784	38.42	7 560 939	16	87	74	8.59	22.35	0.02	0.36	-0.38
Defaulters	886 012	38.04	33 706 954	15	90	80	8.92	23.46	0.01	0.44	-0.16
Book 1	347 259	38.88	13 500 907	17	90	71	8.45	21.73	0.01	0.35	-0.35
Book 2	453 707	37.25	16 900 142	15	89	80	8.93	23.97	0.01	0.43	-0.34
Book 3	31 814	37.71	1 199 800	19	66	76	8.74	23.18	0.05	0.36	-0.52
Book 4	39 166	40.55	1 588 035	18	89	132	11.47	28.29	0.06	0.72	0.17
Book 5	14 066	36.83	518 070	17	88	87	9.31	25.28	0.08	0.63	0.24

Table 3.13. Descriptive statistics.

Table 3.13 above depicts the descriptive statistics for the population. The loan amount, number of loans, sum of loans, default count, and age of the debtors were analysed. These are the variables of interest for the investigation of a typical defaulter profile.

3.4.2 Defaulters

To determine which variables are important when debtors default on an unsecured loan, a hierarchical linear model was used with the debtor as the dependent variable. The variables analysed were the loan amount, number of loans, sum of the loans and age of the debtor.

3.4.2.1 Hierarchical linear model

Statistical analysis tends to produce small p-values as the size of the data sets increases (Ellis & Steyn, 2003:51). The data set used in this analysis is of substantial size and small p-values can be expected. It is thus important to consider the effect of size in order to determine the practical significance of the findings. Tables 3.14 and 3.15 list the variable analysed, as well as the defaulting condition.

Variable number	Variable
1	Loan amount
2	Number of loans
3	Sum of loans
4	Age

Table 3.14. Variables.

Value	Defaulter
0	Non-defaulter
1	Defaulter

Table 3.15. Defaulter classification.

Source	Numerator df	Denominator df	F	Significance	Variable number
Intercept	1	1 082 794	644 123,54	0,000	1
Defaulter	1	1 082 794	1 972,65	0,000	1
Intercept	1	1 082 794	1 405 968,73	0,000	2
Defaulter	1	1 082 794	9 483,60	0,000	2
Intercept	1	1 082 794	575 346,74	0,000	3
Defaulter	1	1 082 794	3 176,42	0,000	3
Intercept	1	1 082 794	11 983 167,25	0,000	4
Defaulter	1	1 082 794	294,51	0,000	5
Intercept	1	886 010	631 408,85	0,000	1
Multiple Defaulter	1	886 010	1 806,57	0,000	1
Intercept	1	886 010	1 259 396,17	0,000	2
Multiple Defaulter	1	886 010	1 521,87	0,000	2
Intercept	1	886 010	505 329,46	0,000	3
Multiple Defaulter	1	886 010	429,98	0,000	3
Intercept	1	886 010	11 615 408,89	0,000	4
Multiple Defaulter	1	886 010	84,17	0,000	4

Table 3.16. Type III tests of fixed effects.

Results for defaulters and multiple defaulters are listed in table 3.16 above.

Parameter	Estimate	Std. Error	df	t	Significance	95% Confidence Interval		Dep. var
						Lower Bound	Upper Bound	
Intercept	5115,97973	5,149954	1 082 794	993,40	0,000	5105,886002	5126,07346	1
Defaulter = 0	-536,54580	12,08041	1 082 794	-44,41	0,000	-560,222998	-512,86861	1
Defaulter = 1	0[b]	0						1
Intercept	2,278963	0,001785	1 082 794	1 276,49	0,000	2,275464	2,282463	2
Defaulter = 0	0,407835	0,004188	1 082 794	97,38	0,000	0,399627	0,416043	2
Defaulter = 1	0[b]	0						2
Intercept	11923,1171	14,47796	1 082 794	823,54	0,000	11894,740842	11951,4934	3
Defaulter = 0	1914,05785	33,96142	1 082 794	56,36	0,000	1847,494619	1980,62108	3
Defaulter = 1	0[b]	0						3
Intercept	38,043451	0,009417	1 082 794	4 039,95	0,000	38,024994	38,061908	4
Defaulter = 0	0,379078	0,022089	1 082 794	17,16	0,000	0,335784	0,422373	4
Defaulter = 1	0[b]	0						4
Intercept	5241,10221	6,071382	886 010	863,25	0,000	5229,202514	5253,00192	1
Mdefaulter = 0	-532,22347	12,52180	886 010	-42,50	0,000	-556,765788	-507,68116	1
Mdefaulter = 1	0[b]	0						1
Intercept	2,241015	0,002006	886 010	1 117,03	0,000	2,237083	2,244948	2
Mdefaulter = 0	0,161417	0,004138	886 010	39,01	0,000	,153307	0,169526	2
Mdefaulter = 1	0[b]	0						2
Intercept	11757,0195	16,52028	886 010	711,67	0,000	11724,640384	11789,3987	3
Mdefaulter = 0	706,515963	34,07193	886 010	20,74	0,000	639,736130	773,295796	3
Mdefaulter = 1	0[b]	0						3
Intercept	37,995231	0,010840	886 010	3 505,06	0,000	37,973985	38,016477	4
Mdefaulter = 0	0,205109	0,022357	886 010	9,17	0,000	0,161290	0,248928	4
Mdefaulter = 1	0[b]	0						4

Table 3.17. Estimates of fixed effects.

Parameter	Estimate	Std. Error	Dependable variable	
Residual	23498831,112102	31936,574897	1	All
Residual	2,824093	0,003838	2	All
Residual	185718283,319522	252404,293503	3	All
Residual	78,568352	0,106780	4	All
Residual	24981752,345388	37533,458556	1	Defaulters
Residual	2,727770	0,004098	2	Defaulters
Residual	184962050,213018	277893,453993	3	Defaulters
Residual	79,636840	0,119649	4	Defaulters

Table 3.18. Estimates of covariance parameters.

Defaulter	Mean	Std. Error	df	95% Confidence Interval		Dependable variable
				Lower Bound	Upper Bound	
0	4579,434	10,928	1 082 794	4558,016	4600,852	1
1	5115,980	5,150	1 082 794	5105,886	5126,073	1
0	2,687	0,004	1 082 794	2,679	2,694	2
1	2,279	0,002	1 082 794	2,275	2,282	2
0	13837,175	30,721	1 082 794	13776,963	13897,387	3
1	11923,117	14,478	1 082 794	11894,741	11951,493	3
0	38,423	0,020	1 082 794	38,383	38,462	4
1	38,043	0,009	1 082 794	38,025	38,062	4
0	4708,879	10,951	886 010	4687,414	4730,343	1
1	5241,102	6,071	886 010	5229,203	5253,002	1
0	2,402	0,004	886 010	2,395	2,410	2
1	2,241	0,002	886 010	2,237	2,245	2
0	12463,536	29,799	886 010	12405,131	12521,940	3
1	11757,020	16,520	886 010	11724,640	11789,399	3
0	38,200	0,020	886 010	38,162	38,239	4
1	37,995	0,011	886 010	37,974	38,016	4

Table 3.19. Estimated marginal means.

From the above the following can be concluded:

- Among the debtors population (*N* = 1 082 794), there was a statistically significant difference between defaulters and non-defaulters regarding the loan amount, defaulters (*M* = 5115.98, *SD* = 5003.27) and non-defaulters (*M* = 4579.43, *SD* = 4073.43), *t*(98) = 993.40, *p* ≤ 0.05, *CI.95* 5105.87, 5126.07. Cohen's effects size value (*d* = 0.07) suggests a low practical significance.
- Among the debtors population (*N* = 1 082 794), there was a statistically significant difference between defaulters and non-defaulters regarding the number of loans, defaulters (*M* = 2.28, *SD* = 1.65) and non-defaulters (*M* = 2.69, *SD* = 1.80), *t*(98) = 1276.49, *p* ≤ 0.05, *CI.95* 2.27, 2.28. Cohen's effects size value (*d* = 0.16) suggest a low practical significance.
- Among the debtors population (*N* = 1 082 794), there was a statistically significant difference between defaulters and non-defaulters regarding the sum of the loans, defaulters (*M* = 11923.12, *SD* = 13603.37) and non-defaulters (*M* = 13837.18, *SD* = 13737.54), *t*(98) = 823.54, *p* ≤ 0.05, *CI.95* 11894.74, 11951.49. Cohen's effects size value (*d* = 0.09) suggests a low practical significance.

- Among the debtors population (*N* = 1 082 794), there was a statistically significant difference between defaulters and non-defaulters regarding the debtors' age, defaulters (*M* = 38.04, *SD* = 8.92) and non-defaulters (*M* = 38.42, *SD* = 8.59), *t*(98) = 4039.95, $p \leq 0.05$, *CI.95* 38.02, 38.06. Cohen's effects size value (*d* = 0.02) suggest a low practical significance.

3.4.2.1 Classification trees

Classification trees were constructed to obtain accurate predictions on defaults on unsecured loans. This was done for all five of the debtor books. Four basic steps were followed in the setup of the classification trees. Criteria were set for the following:

- Predictive accuracy.
- Selection splits.
- Stop splitting.
- Right size tree.

Classification trees are dependent on the choice of analysis options used to produce them. All five variables were used in the initial analysis. The root node splits, forming two or more nodes, and this process is repeated until the end node is formed, which classifies the end leaf node variable.

The setup parameters for the analysis were as follows:

Analysis number:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Ordered predictors	5	4	4	5	4	5	4	4	5	4	5	4
Learning sample N	28557	29407	29407	20205	20205	23493	23493	23493	21529	21529	9374	9374
Test sample N	11057	11413	11413	10695	10695	12298	12298	12298	11914	11914	4779	4779
Categorical predictors	2											
Number of classes	2											
Dependent variable	Defaulter											
Split selection method	Discriminant-based univariate splits											
P level	0.05000000											
Stopping rule	Direct stopping											
Fraction of objects	0.05000000											
v-fold CV:3	3											
Prior probabilities	Estimated from data											
Misclassification cost	Equal											
Goodness of fit	Gini measure											
Random number seed	12,34,56,78											

3.4.2.1.1 Analysis 1 – book number 1

Category	**All groups** Frequency table: Multiple defaults (Book 1 - 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	12795	12795	31.34416	31.3442
1	28026	40821	68.65584	100.0000
Missing	0	40821	0.00000	100.0000

Table 3.20. Analysis 1 - book number 1 (All groups).

Category	**Learning sample** Frequency table: Multiple defaults (Book 1 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	9662	9662	32.85501	32.8550
1	19746	29408	67.14499	100.0000
Missing	0	29408	0.00000	100.0000

Table 3.21. Analysis 1 - book number 1 (Learning sample).

Category	**Test sample** Frequency table: Multiple defaults (Book 1 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	3133	3133	27.45115	27.4512
1	8280	11413	72.54885	100.0000
Missing	0	11413	0.00000	100.0000

Table 3.22. Analysis 1 - book number 1 (Test sample).

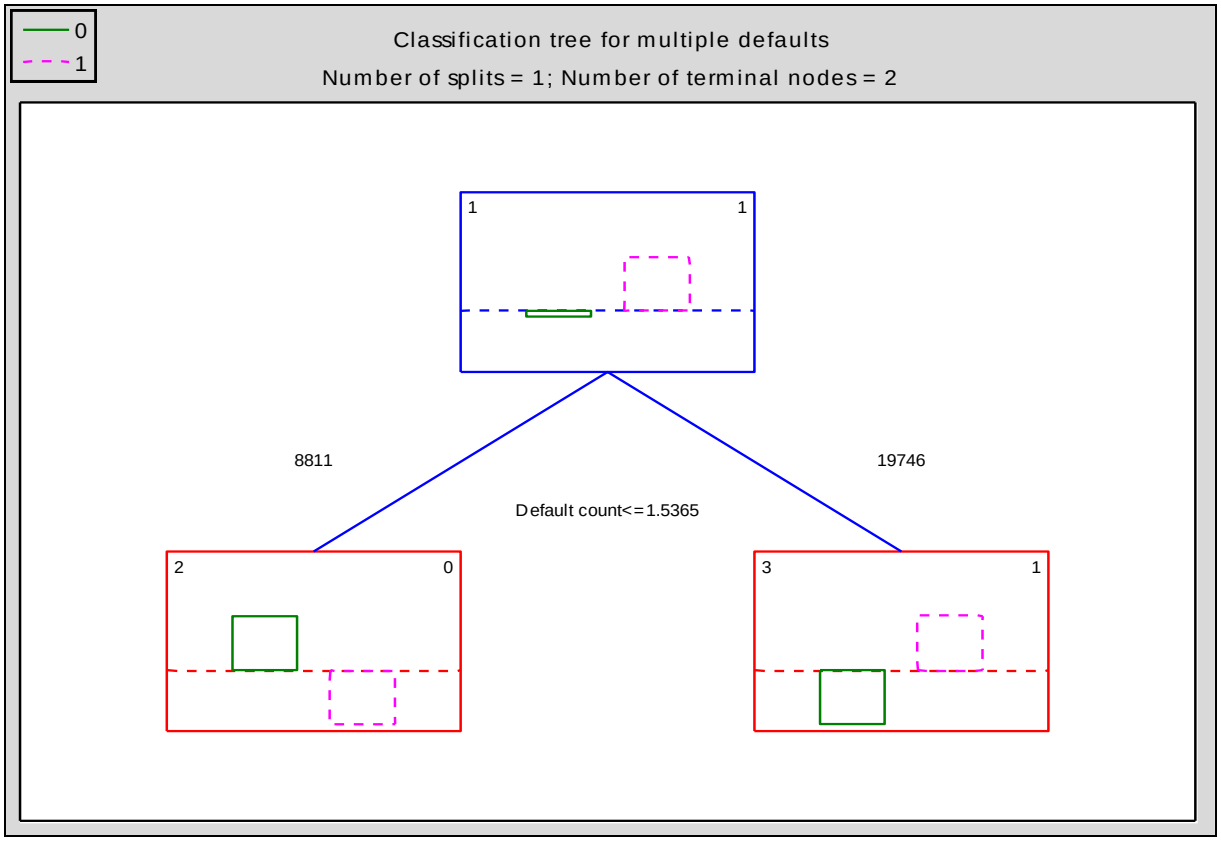

Figure 3.24: Classification tree 1 - book number 1.

From figure 3.23 above it can be seen that the first node is split into two sub-nodes where the left node is smaller or equal to 1.5365 defaults. It can be seen from figure 3.25 below that the number of defaults is the only ranking variable predictor and the decision tree does not divide into further sub-nodes after the initial division.

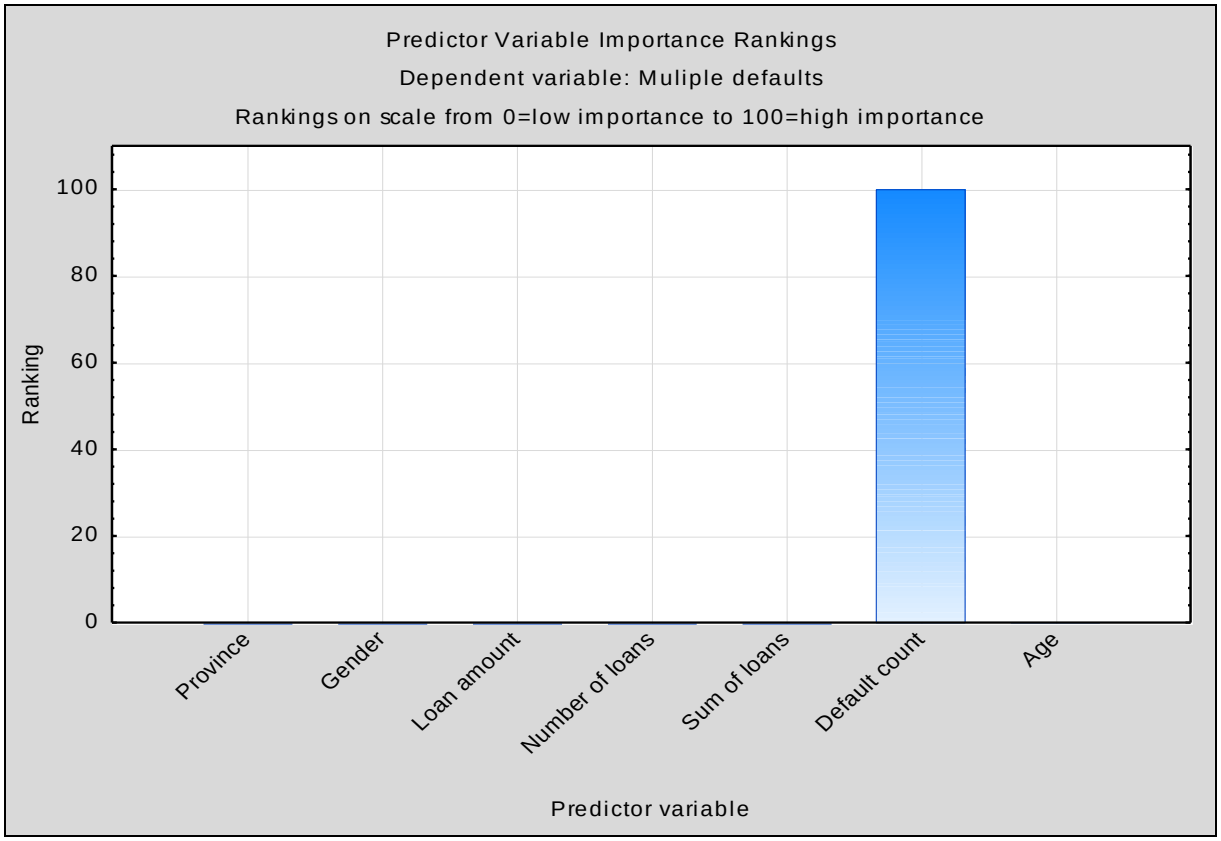

Figure 3.25: Analysis 1 – book number 1. Predictor variable ranking.

Class	Test sample misclassification matrix (Book 1 – 0 and 1) Predicted (row) x observed (column) matrix CV cost = 0.; s.d. CV cost = 0.	
	Class 0	Class 1
0		0
1	0	

3.4.2.1.2 Analysis 2 – book number 1

In the second analysis, the default count is removed to evaluate the effect without this variable.

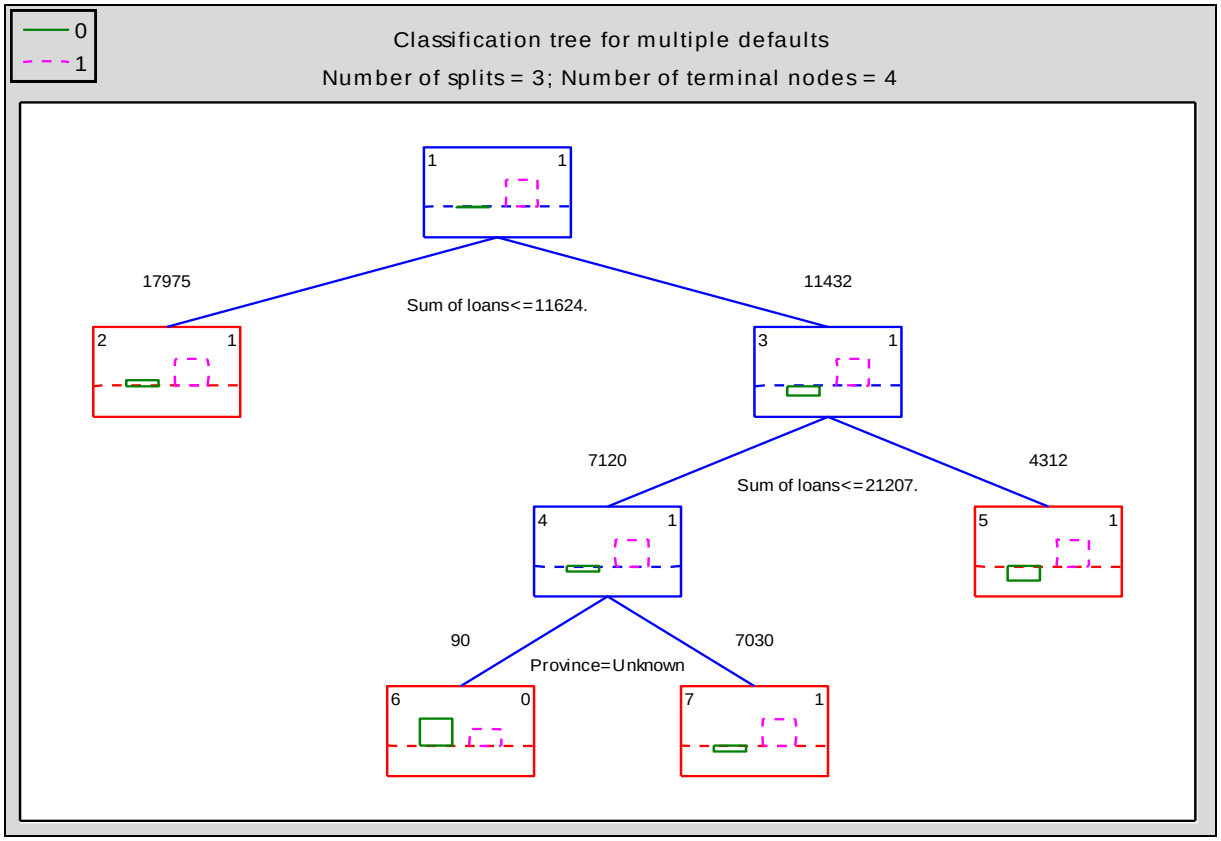

Figure 3.26: Classification tree 2 - book number 1.

In figure 3.26 above it can be seen that the parent node is split further into a total of four terminal nodes. From figure 3.27 below it can be seen that more variables are used in the decision and the sum of loans and number of loans are used as strong predictors. The first split produces a terminal node where the sum of loans is smaller or equal to R11 624. This node, number two, represents all defaulters with loans of less than R11 624. Node five represents an end node where the sum of the loans is more than R21 207 and all are defaulters. Node six represents non-defaulters with the sum of the loans less than or equal to R21 207 and the province is unknown. Node seven represents defaulters with the sum of the loans less than or equal to R21 207 and the province is unknown.

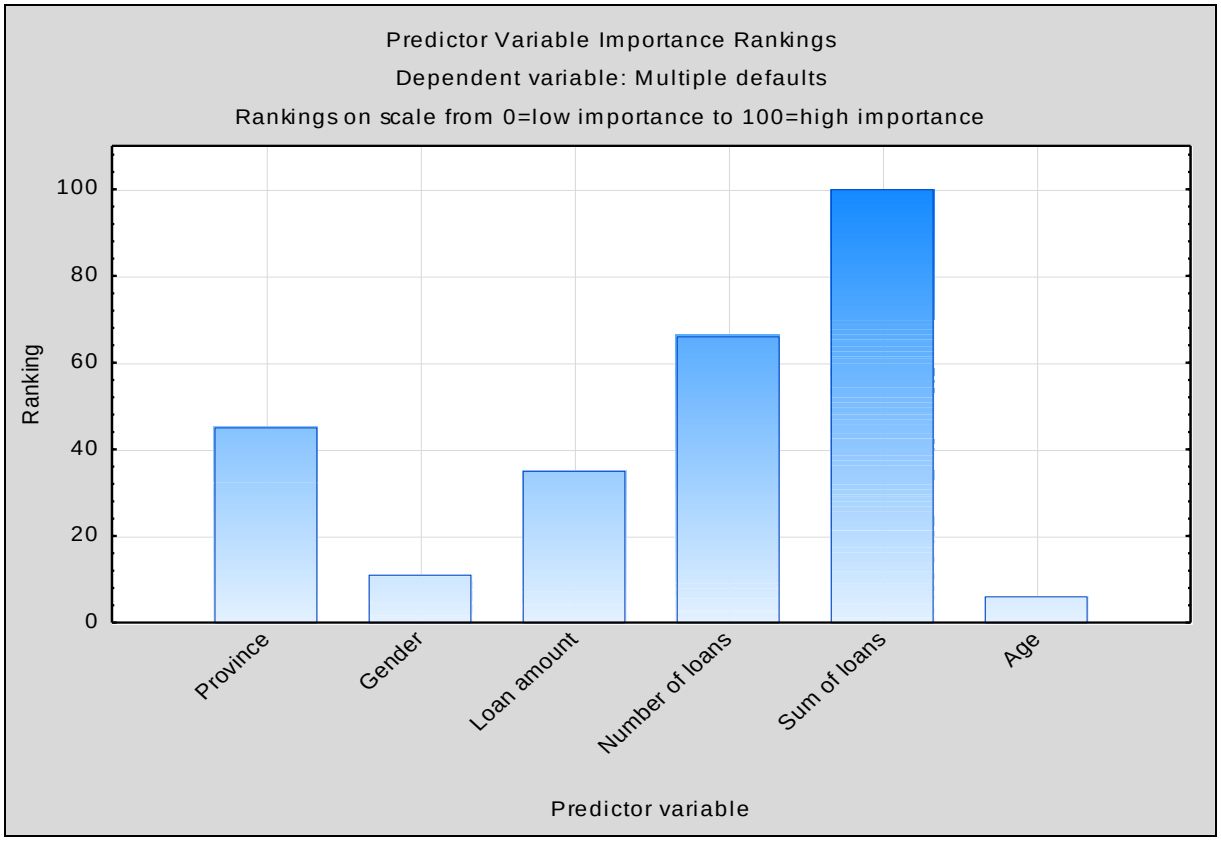

Figure 3.27: Analysis 2 – book number 1. Predictor variable ranking.

Class	Test sample misclassification matrix (Book 1- 0 and 1) Predicted (row) x observed (column) matrix CV cost = .27469; s.d. CV cost = .00418	
	Class 0	Class 1
0		15
1	3120	

3.4.2.1.3 Analysis 1 – book number 2

Category	**All Groups** Frequency table: Multiple defaults (Book 2 - 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	6539	6539	21.16181	21.1618
1	24361	30900	78.83819	100.0000
Missing	0	30900	0.00000	100.0000

Table 3.23. Analysis 1 - book number 2 (All groups).

Category	**Learning sample** Frequency table: Multiple defaults (Book 2 - 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	4473	4473	22.13808	22.1381
1	15732	20205	77.86192	100.0000
Missing	0	20205	0.00000	100.0000

Table 3.24. Analysis 1 - book number 2 (Learning sample).

Category	**Test sample** Frequency table: Multiple defaults (Book 2 - 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	2066	2066	19.31744	19.3174
1	8629	10695	80.68256	100.0000
Missing	0	10695	0.00000	100.0000

Table 3.25. Analysis 1 - book number 2 (Test sample).

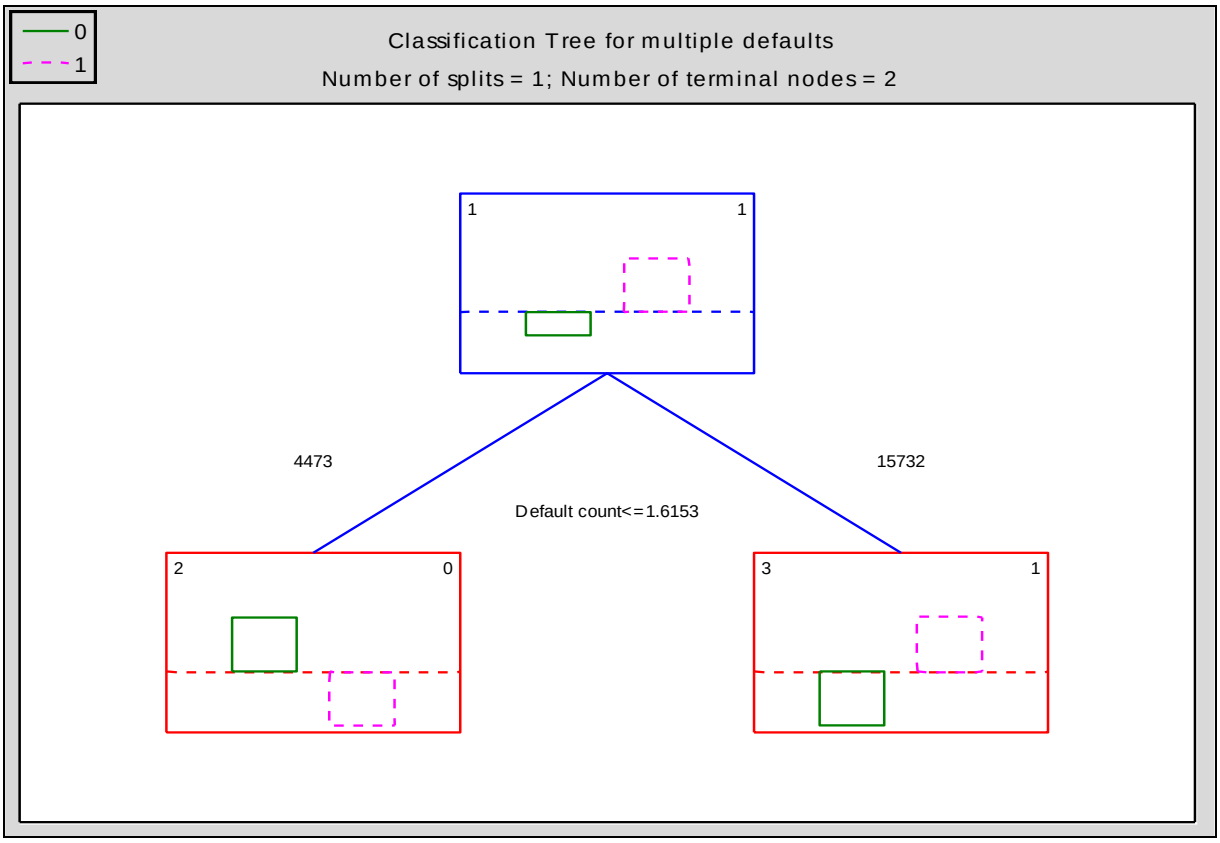

Figure 3.28: Classification tree 1 - book number 2.

Class	Test sample misclassification matrix (Book 2 - 0 and 1) Predicted (row) x observed (column) matrix CV cost = 0.; s.d. CV cost = 0.	
	Class 0	Class 1
0		0
1	0	

From figure 3.26 above it can be seen that a single split is obtained with a default count equal to or less than 1.6153 and the second part more than 1.6153. Default count is used as the predictor variable.

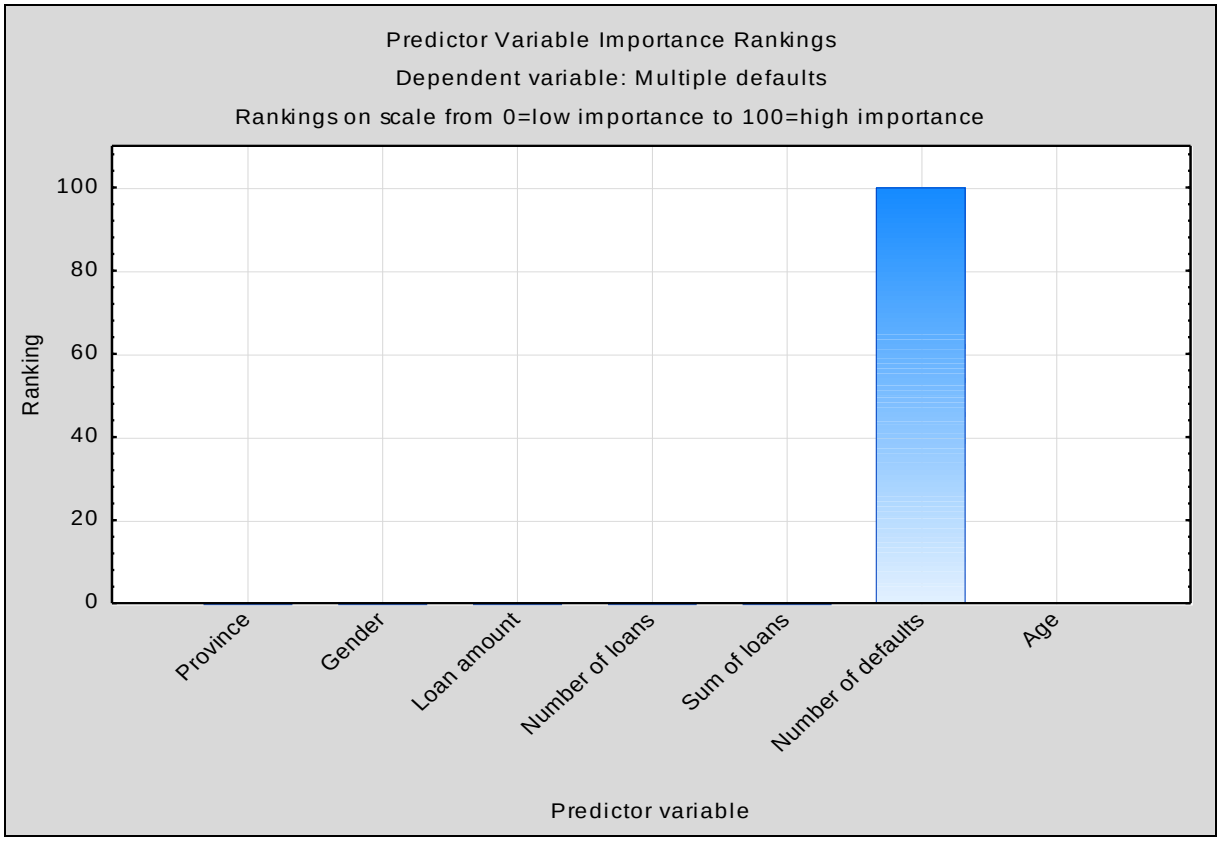

Figure 3.29: Analysis 1 – book number 2. Predictor variable ranking.

3.4.2.1.4 Analysis 2 – book number 2

In the second analysis, the default count was removed and the model was re-run. From figures 3.30 and 3.31 below it can be seen that the sum of loans, number of loans and loan amount are predominantly used in the model. The first split is done with debtors having a loan amount equal to or less than R1 500. This resulted in node 2, with defaulters owing R7 388 and node 3, with debtors owing R12 817. Node 3 was further split into non-defaulters with a loan amount of equal to or less than R400.36 and node 4, with defaulting debtors owing loan amounts of more than R400.36.

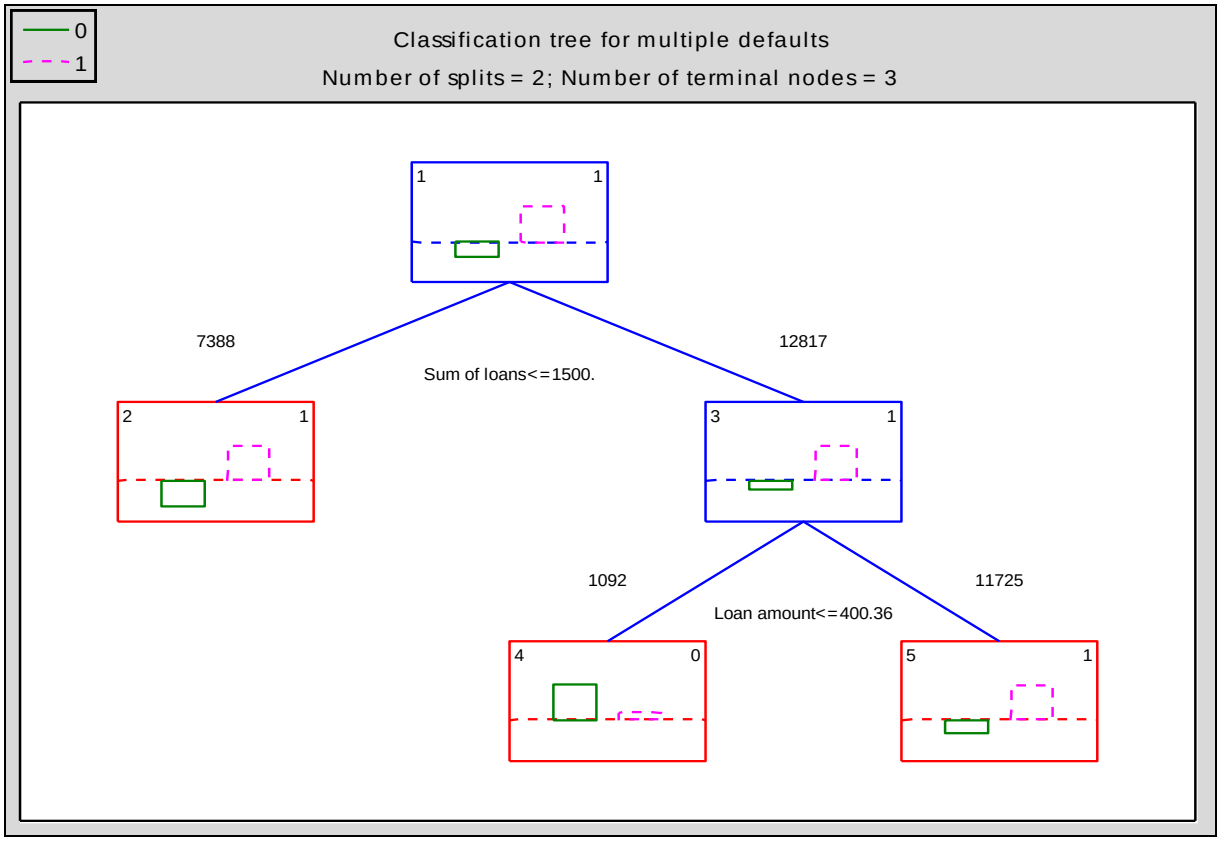

Figure 3.30: Classification tree 2 - book number 2.

Class	Test sample misclassification matrix (Book 2 - 0 and 1) Predicted (row) x observed (column) matrix CV cost = .19663; s.d. CV cost = .00384	
	Class 0	Class 1
0		44
1	2059	

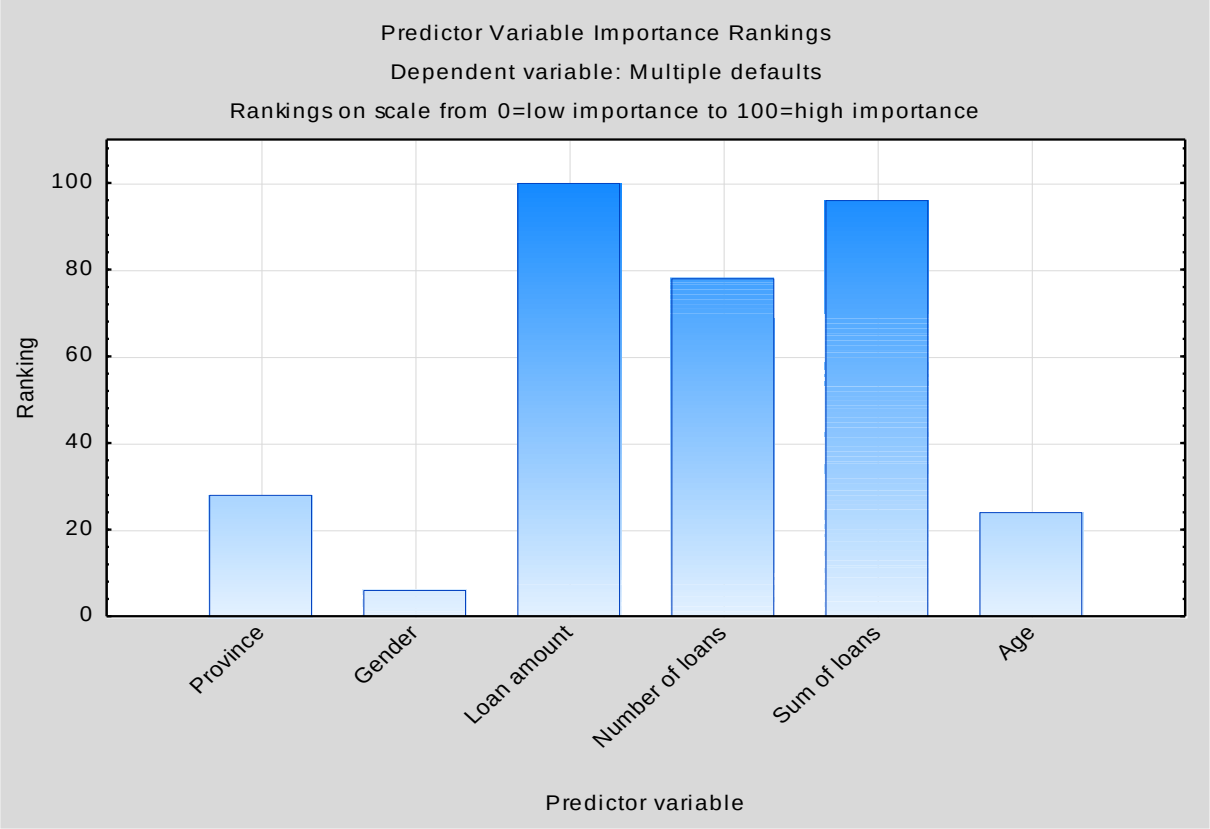

Figure 3.31: Analysis 2 – book number 2. Predictor variable ranking.

3.4.2.1.5 Analysis 1 – book number 3

Category	**All Groups** Frequency table: Multiple defaults (Book 3 - 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	14180	14180	39.61890	39.6189
1	21611	35791	60.38110	100.0000
Missing	0	35791	0.00000	100.0000

Table 3.26. Analysis 1 - book number 3 (All groups).

Category	Learning sample Frequency table: Multiple defaults (Book 3 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	9305	9305	39.60754	39.6075
1	14188	23493	60.39246	100.0000
Missing	0	23493	0.00000	100.0000

Table 3.27. Analysis 1 - book number 3 (Learning sample).

Category	Test sample Frequency table: Multiple defaults (Book 3 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	4875	4875	39.64059	39.6406
1	7423	12298	60.35941	100.0000
Missing	0	12298	0.00000	100.0000

Table 3.28. Analysis 1 - book number 3 (Test sample).

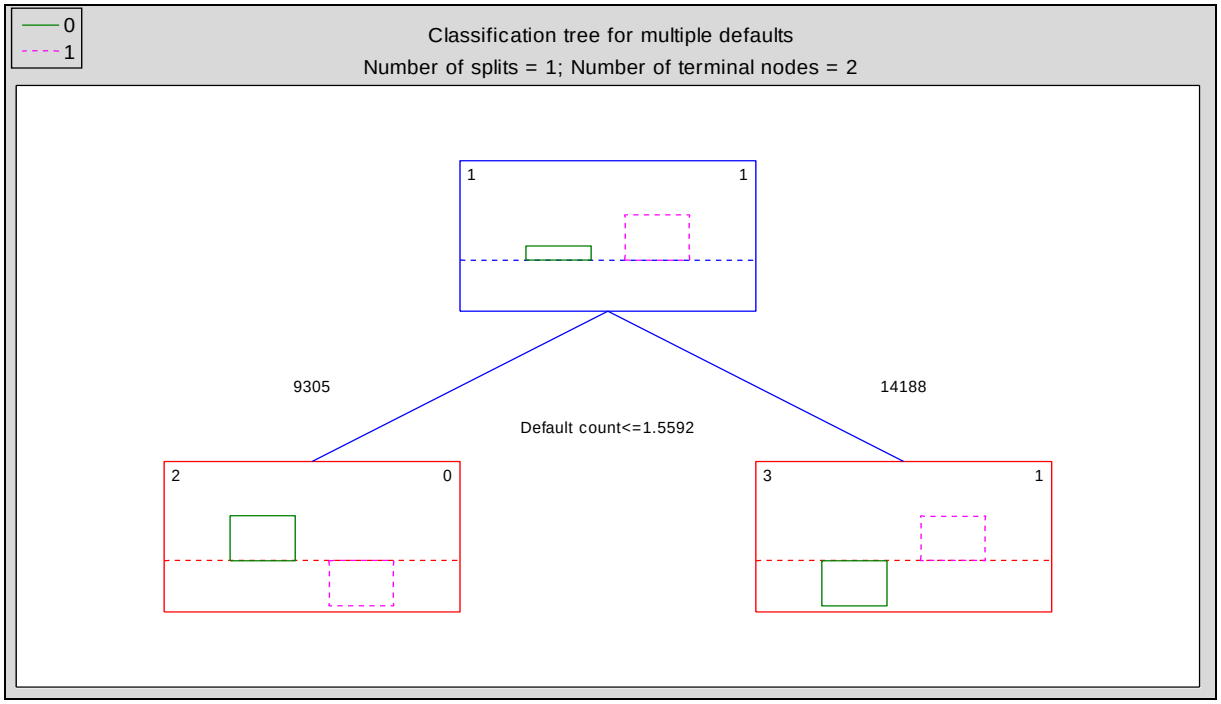

Figure 3.32: Classification tree 1 - book number 3.

Class	Test sample misclassification matrix (Book 3 – 0 and 1) Predicted (row) x observed (column) matrix CV cost = 0.; s.d. CV cost = 0.	
	Class 0	Class 1
0		0
1	0	

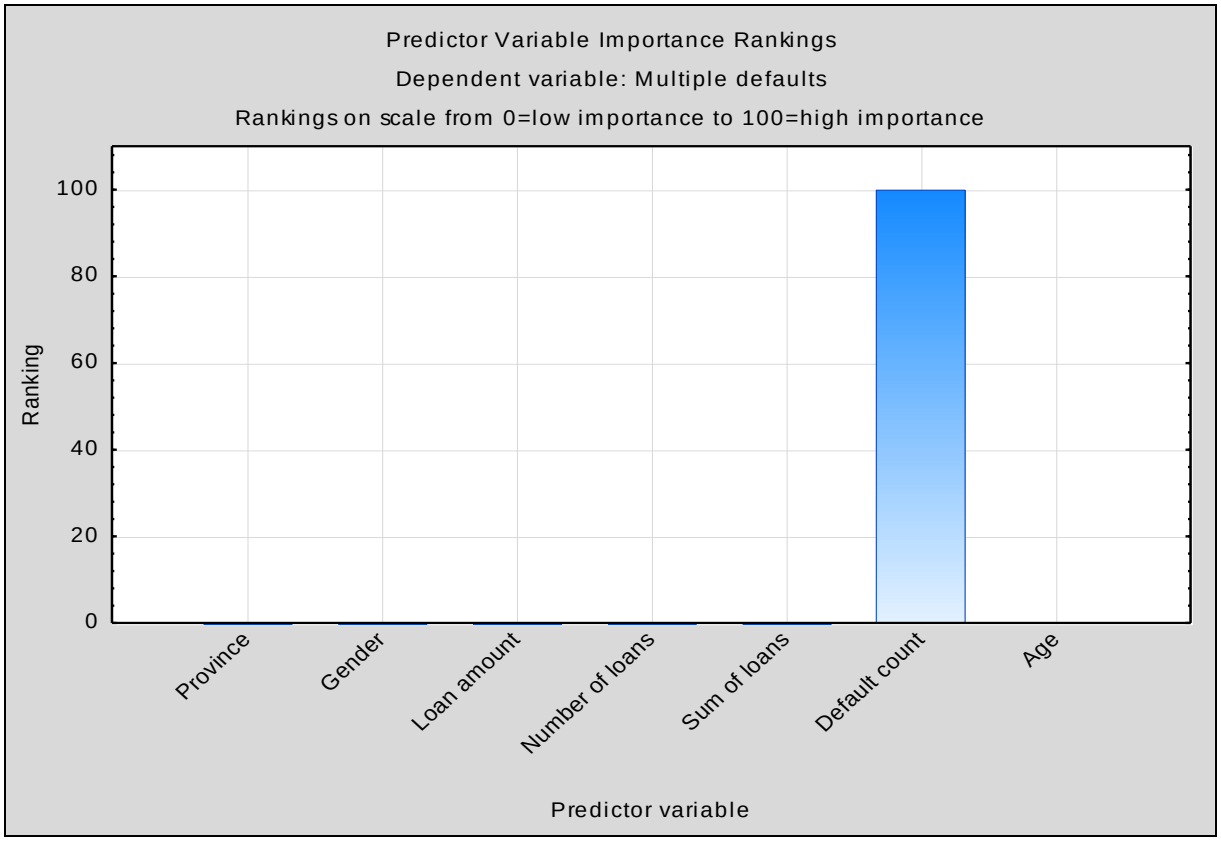

Figure 3.33: Analysis 1 – book number 3. Predictor variable ranking.

As seen in figures 3.32 and 3.33 above, the default count is used in the first split, with a default count of equal to or less than 1.5592 giving the non-defaulting group and above 1.5592 the defaulting group.

3.4.2.1.6 Analysis 2 – book number 3

The default count is once again removed and a much more complex model is produced for book 2. As seen from figure 3.34, province is now used as the main predictor and all the other variables are used in the rest of the model, producing a classification tree as seen in figure 3.6. In the first split debtors from KwaZulu-Natal are split off and females are split further into node number 4, as non-defaulters. Males in KwaZulu-Natal are split off into node 5 as defaulters. Node 4 is then further split into number of loans equal to or less than 2.4894, as non-defaulting and those more than 2.4894 as defaulting.

Node 3 is split into the sum of loans equal to or less than R4 934.3 as defaulters and those above also as defaulters. Node 7 is not split further. Node 6 is split into Limpopo province as defaulters and the rest of the provinces to node 11. Node 12 includes Mpumalanga, the Western Cape, KwaZulu-Natal, Limpopo, North West, the Eastern Cape and unknown. Node 12 is split into age equal to or less than 54.617 and those above. Ages above 54.617 are non-defaulters in node 15. Node 14 splits into ages equal to or less than 37.624 as a terminal node of defaulters and those above also as defaulters. Node 17 splits into number of loans equal to or less than 1.1526. The final split is into number of loans equal to or less than 52.49, which are defaulters, and those above 52.49, which are non-defaulters.

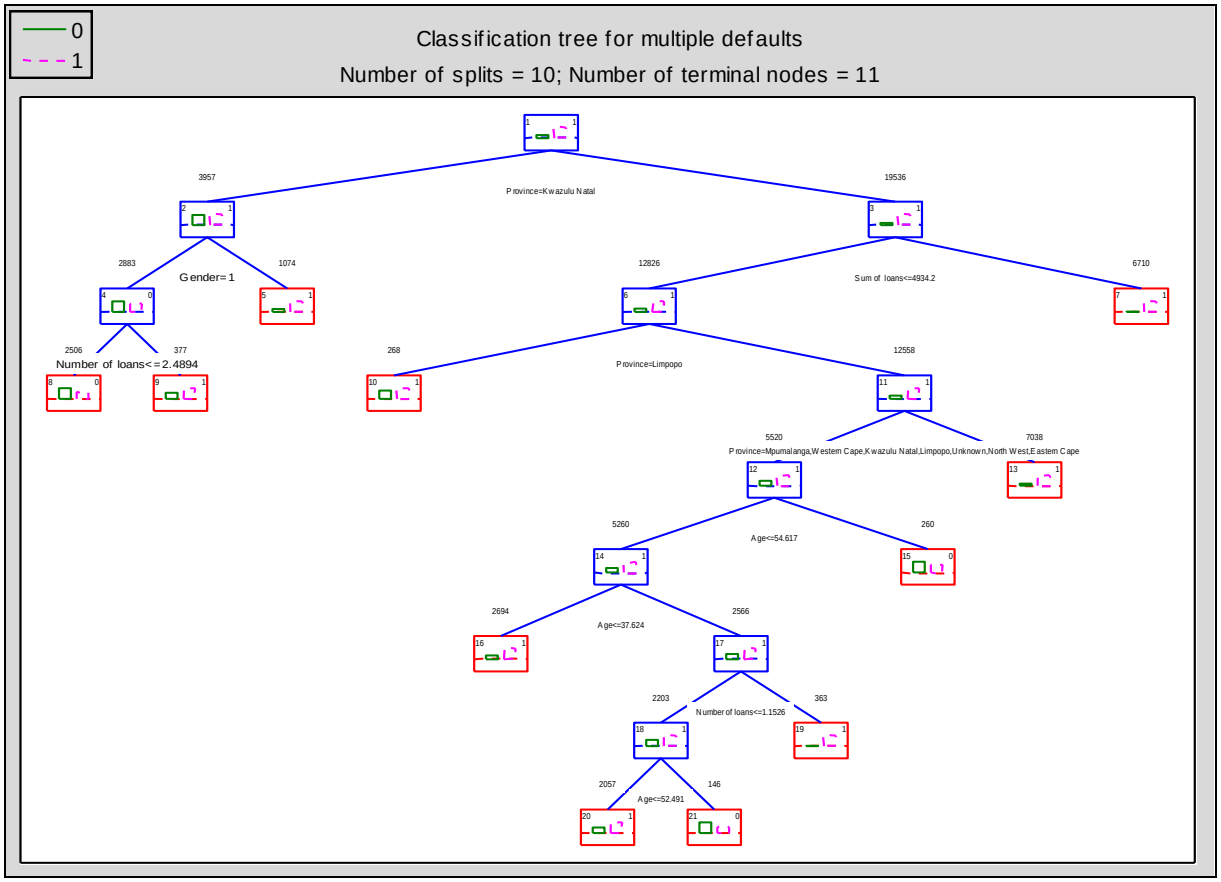

Figure 3.34: Classification tree 2 - book number 3.

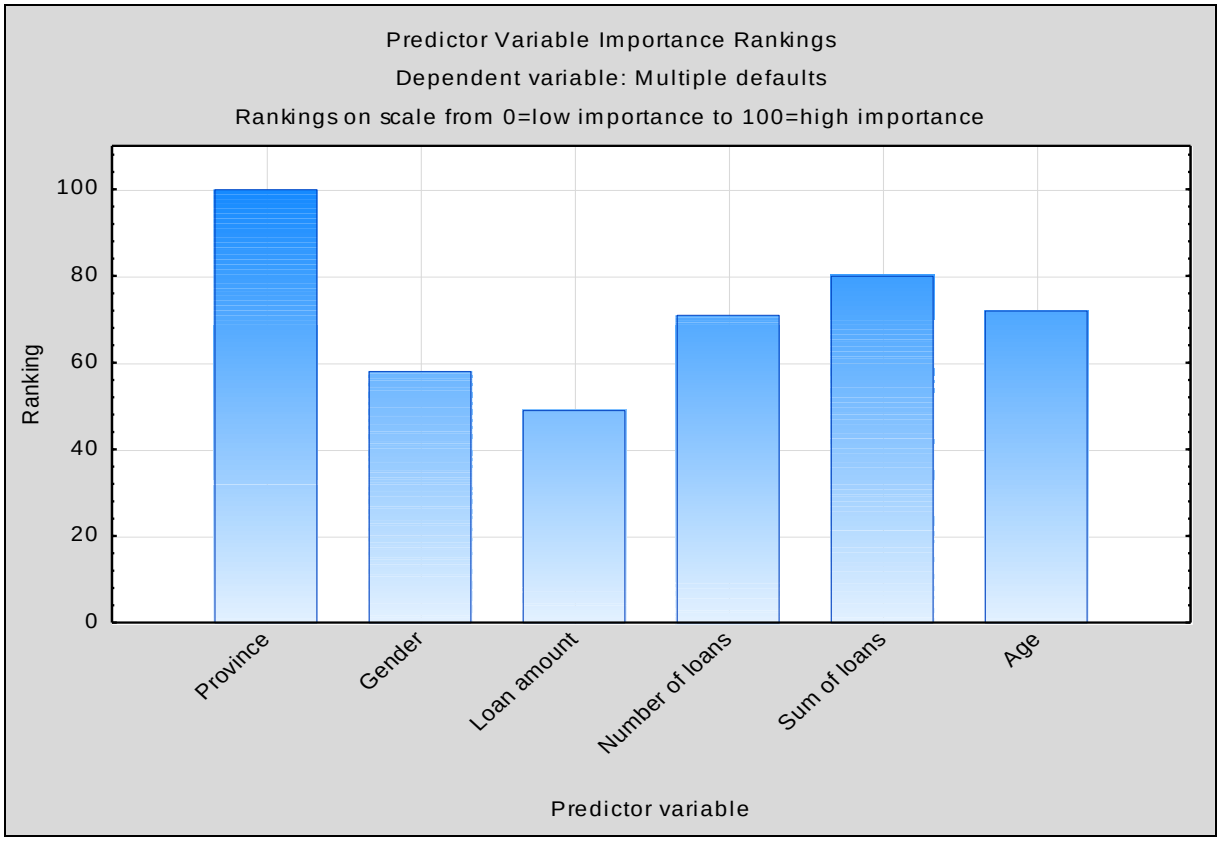

Figure 3.35: Analysis 2 – book number 3. Predictor variable ranking.

Class	Test sample misclassification matrix (Book 3 – 0 and 1) Predicted (row) x observed (column) matrix CV cost = .39592; s.d. CV cost = .00441	
	Class 0	Class 1
0		495
1	4374	

3.4.2.1.7 Analysis 1 – book number 4

Category	**All Groups** Frequency table: Multiple defaults (Book 4 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	1338	1338	4.00084	4.0008
1	32105	33443	95.99916	100.0000
Missing	0	33443	0.00000	100.0000

Table 3.29. Analysis 1 - book number 4 (All groups).

Category	**Learning sample** Frequency table: Multiple defaults (Book 4 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	850	850	3.94816	3.9482
1	20679	21529	96.05184	100.0000
Missing	0	21529	0.00000	100.0000

Table 3.30. Analysis 1 - book number 4 (Learning sample).

Category	**Test sample** Frequency table: Multiple defaults (Book 4 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	488	488	4.09602	4.0960
1	11426	11914	95.90398	100.0000
Missing	0	11914	0.00000	100.0000

Table 3.31. Analysis 1 - book number 4 (Test sample).

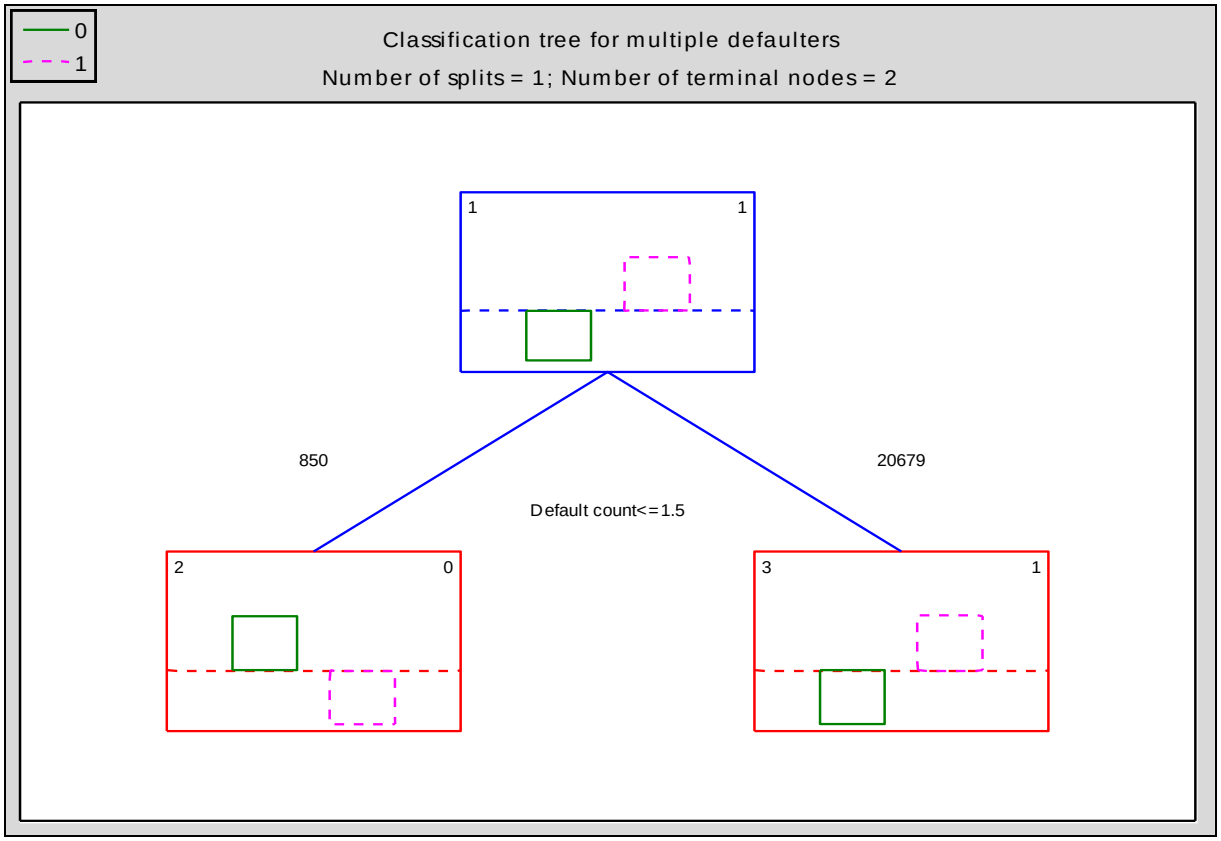

Figure 3.36: Classification tree 1 - book number 4.

From figure 3.37 above and figure 3.38 below it can be seen that default count is again used as the predominant factor to split book number 4 into two nodes, those equal to or less than 1.5 defaults and those more than 1.5.

Class	Test sample misclassification matrix (Book 4 – 0 and 1) Predicted (row) x observed (column) matrix CV cost = 0.; s.d. CV cost = 0.	
	Class 0	Class 1
0		0
1	0	

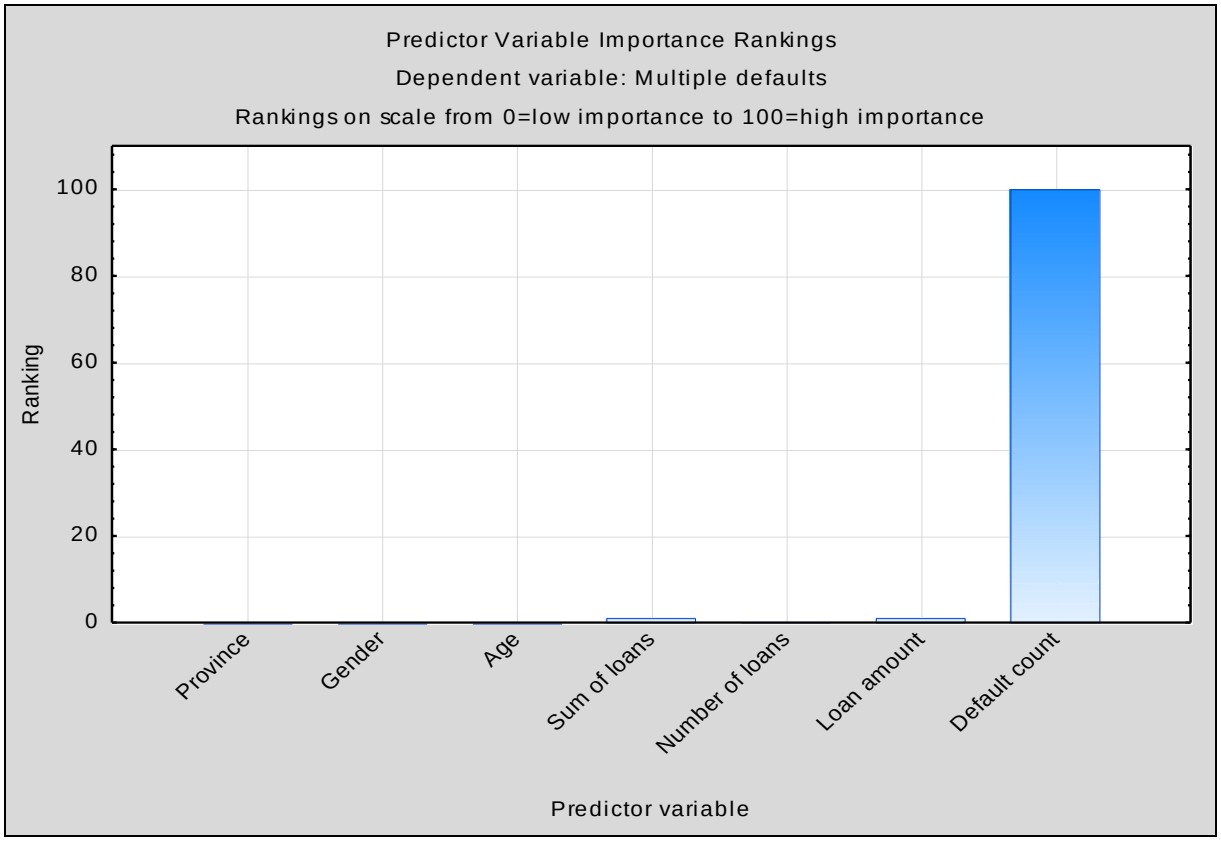

Figure 3.37: Analysis 1 – book number 4. Predictor variable ranking.

3.4.2.1.8 Analysis 2 – book number 4

When default count is removed from the book 4 analysis, the model cannot split the sample into any groups, as seen in figure 3.38 below.

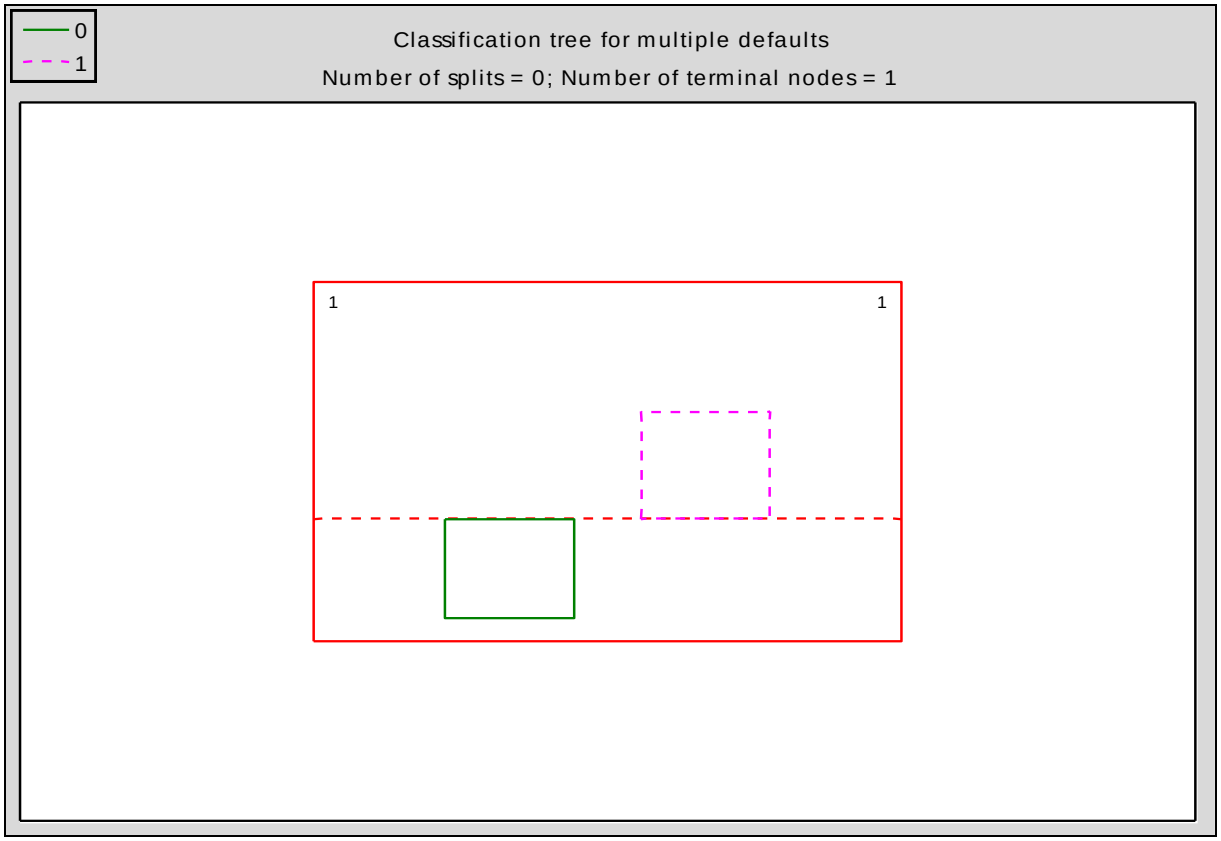

Figure 3.38: Classification tree 2 - book number 4.

3.4.2.1.9 Analysis 1 – book number 5

Category	**All groups** Frequency table: Multiple defaults (Book 5 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	819	819	5.78676	5.7868
1	13334	14153	94.21324	100.0000
Missing	0	14153	0.00000	100.0000

Table 3.32. Analysis 1 - book number 5 (All groups).

Category	**Learning sample** Frequency table: Multiple defaults (Book 5 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	525	525	5.60060	5.6006
1	8849	9374	94.39940	100.0000
Missing	0	9374	0.00000	100.0000

Table 3.33. Analysis 1 - book number 5 (Learning sample).

Category	**Test sample** Frequency table: Multiple defaults (Book 5 – 0 and 1)			
	Count	Cumulative count	Percentage	Cumulative percentage
0	294	294	6.15191	6.1519
1	4485	4779	93.84809	100.0000
Missing	0	4779	0.00000	100.0000

Table 3.34. Analysis 1 - book number 5 (Test sample).

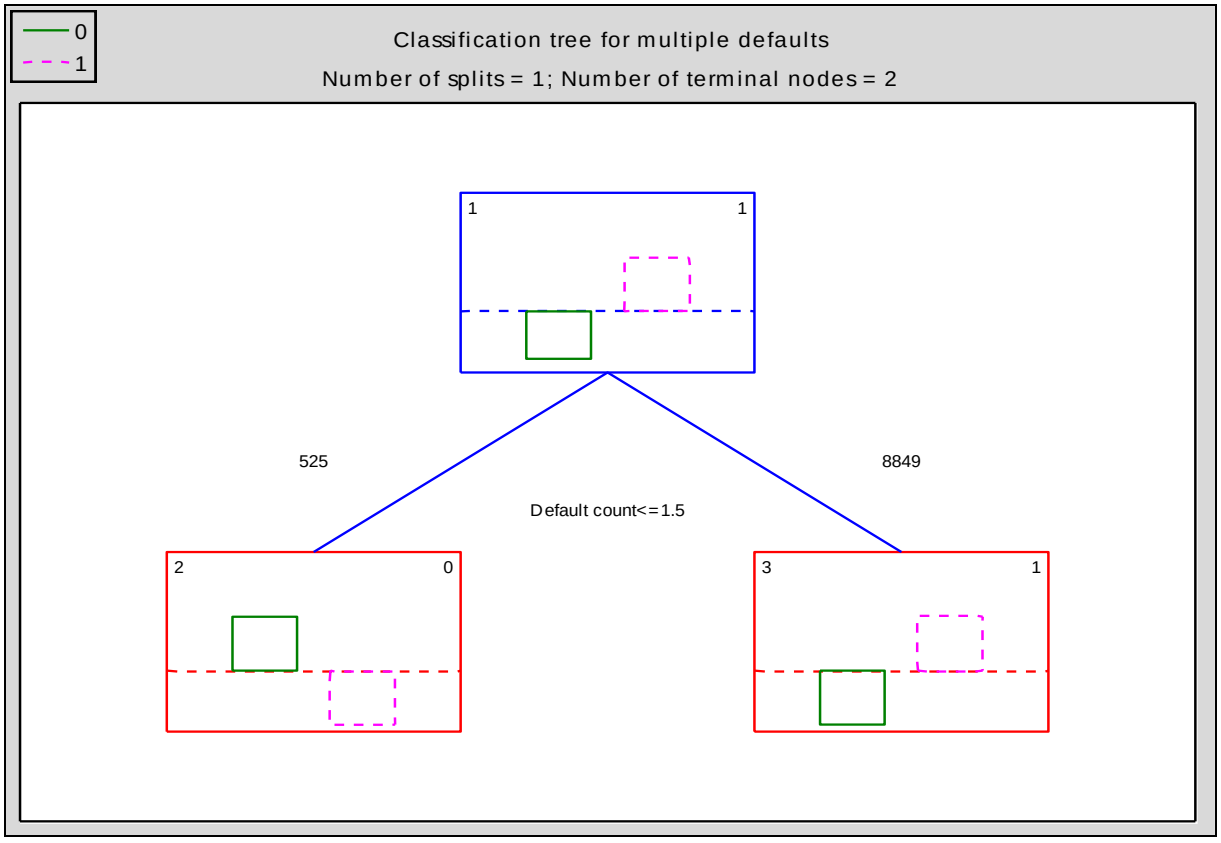

Figure 3.39: Classification tree 1 - book number 5.

From figure 3.40 above and figure 3.41 below it can be seen that the predominant split is once again made on default count. Node 2 represents debtors who did not default with a default count equal to or less than 1.5. Node 3 represents those debtors who did default and had a default count of more than 1.5.

Class	Test sample misclassification matrix (Book 5 – 0 and 1) Predicted (row) x observed (column) matrix CV cost = 0.; s.d. CV cost = 0.	
	Class 0	Class 1
0		0
1	0	

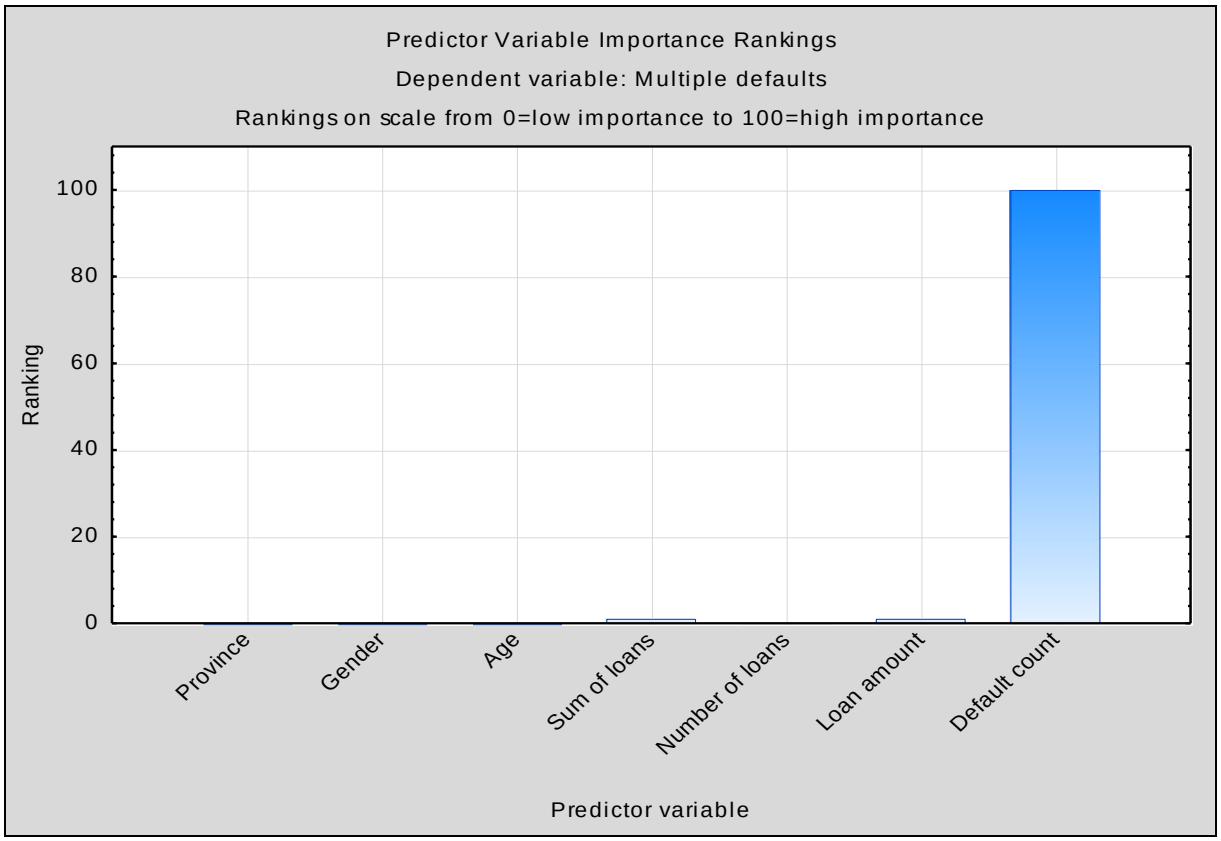

Figure 3.40: Analysis 1 – book number 5. Predictor variable ranking.

3.4.2.1.10 Analysis 2 – book number 5

When default count was removed from the model in book 5, no further results could be obtained, as seen in figure 3.41 below.

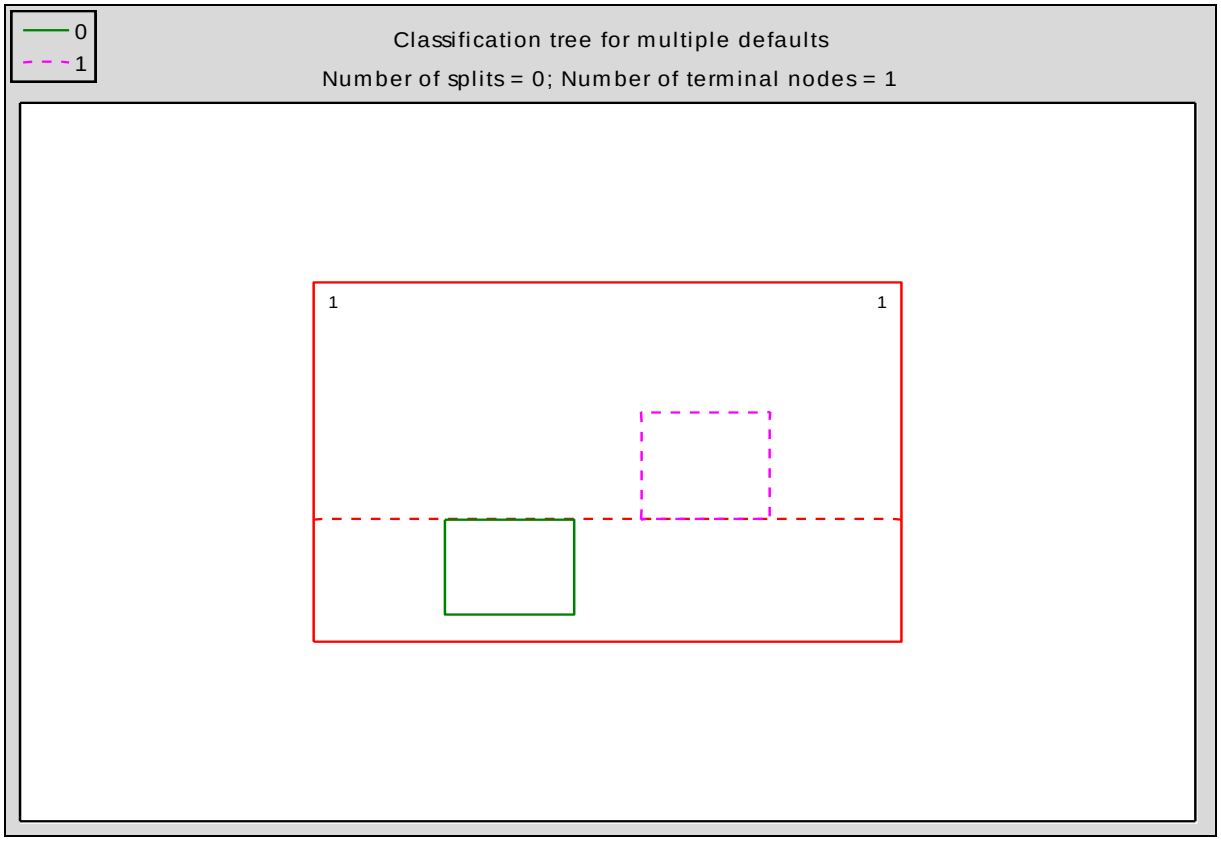

Figure 3.41: Classification tree 2 - book number 5.

3.4.3 Conclusion

All five of the debtors' book analysed are of substantial size, the smallest being book 5, consisting of 14 164 loans and the largest being book 2, consisting of 530 332 loans. The average number of loans is similar for all five books, although the average loan sizes differ substantially between the books. On average, the loan size for book 1 is R6 268.65 and that of book 5 is R1 520.72. The risk criteria between the books might differ and the management of the loan origination process might have differed when the loans were granted. There is a similar age distribution between the different

debtors' books and the age bracket 30 to 40 years of age dominates the debtors' age distribution. They might struggle to get a loan granted for various reasons. Younger debtors might struggle to find permanent employment and this might exclude them from obtaining unsecured loans.

Female debtors are in the majority in all the debtor books except book 5, where there are marginally more males than females. Loan sizes can be expected to be small in the unsecured loan market. This can be seen in figure 3.5, where the majority of the loans are less than R6 000.00. Loans less than R1 500.00 are in the majority, with a total of 254 943 loans in this category. The loan size distribution is similar in all five debtors' books. Gauteng is the province with the highest distribution of debtors in this study. KwaZulu-Natal and the Eastern Cape also contribute large numbers. The geographic spread is consistent for all five debtors' books except in the Eastern Cape, where book 1 features stronger than book 2.

The number of loans per debtors' book follow the same distribution in the five books. The majority of debtors take one or two loans and 89.4% of the distribution is within three loans. Debtors seem to be paying off one loan with another. In exceptional cases, debtors have up to 24 loans. The ultimate profile of a debtor in this study is a female debtor, aged 36 years, taking one loan of R3 000.00 in Gauteng.

From the defaulting population in table 3.6, it can be seen that 89.05% of initial debtors defaulted on their loans, which amounted to 81.83% of the loans. This indicates that micro-lenders in the unsecured loans industry can expect a very low percentage of the initial loans to perform as expected. Only 29.14% of the initial loans are paid off without any default and only 53% of all the accounts are paid off within a ten-year period. Book 1 had the best profile in this regard, with 58.61% paid off within the period. Book 1 also had the lowest default rate at 75.65%. Books 4 and 5 had an almost total default rate. This could also be the reason why the decision tree could not be split into further nodes in figures 3.10 and 3.11. The analysis could not go beyond the number of defaults to split into further nodes because the first factor under consideration represented more than 98% of the population.

The age distribution for both the total population and per book follows the same distribution pattern as the debtor population. The age group 30 to 40 years of age is

most prominent within the defaulting population. Gender distribution is the same in the non-defaulting and defaulting population, with females accounting for 56% of the debtor population as well as the defaulting population. This could further explain the lack of substantial splits in the decision tree regarding gender. Because of the similarity in the non-defaulting and defaulting population, it is impossible to split into any nodes that differ substantially from each other.

The loan size distribution follows the same distribution pattern as for the total population. High loan sizes dominated the defaulter's population, with 174 708 debtors falling in this category. This is predominantly seen in book 1, where most of the bigger loans originated, as reflected in figure 3.6. Book 2 is most prominent in all the defaulting loan sizes except the larger than R12 000 category. This is similar to the number of loans initially originating within the books.

The provincial distribution of the total population and that of the defaulting population follow the same pattern, with Gauteng the most prominent in both cases. This is also the finding of the NCR (*Consumer Credit Market Report*, 2012:2). On book level, the same pattern is also observed. The number of loans follows the same pattern; the non-defaulting population's (figure 3.7) and the defaulting population's patterns (figure 3.19) are almost identical.

The ultimate profile of a defaulter is a 36-year-old female residing in Gauteng taking out one loan of R3 000.00. This profile (table 3.9) is identical to the profile of a debtor (table 3.5) within the study. This holds true on debtors' book level except for a small difference in the age of a defaulter in book 1.

The age distribution of multiple defaulters is the same as that of the defaulting population, most prominent in the age range 30 to 40 years of age. Females are most prominent in the multiple defaulters category. Their default percentage is 56%, which is the same as the defaulting population and the debtors population. The profile regarding gender distribution is the same in the debtors population, defaulters population and multiple defaulters population. In the defaulting population, 76% of all defaulters will default multiple times within the period.

The geographic distribution of multiple defaulters is similar to that of the total defaulters group. Considering that 76% of all defaulters will default multiple times, this is to be expected.

The profile of a non-defaulter is a 36-year-old female living in Gauteng and taking out two loans with a value of R400.00 each. When one looks at the total population of defaulters and non-defaulters, there are some differences. The loan amount is substantially less in the non-defaulting group versus the defaulting group. This might be because it is easier to repay R400.00 than R3 000.00 in the defaulting group or because the non-defaulting group uses one loan to pay off another. This difference between non-defaulters and defaulters is also observed within the five debtors' books.

The hierarchical linear model shows a statistical difference in loan amount, number of loans, sum of loans and age between defaulters and non-defaulters. This is, however, not of practical importance. Considering the large percentage of defaults within the population and the length of time over which these debtors have been evaluated, these effects might have been reduced to insignificant levels. An evaluation in the earlier stages might prove useful in predicting differences within these parameters.

Classification trees did not produce significant results to conclude which parameters could be used to predict default in a population. Books 4 and 5 had an exceptionally high percentage of defaults, and therefore, no split could be made when excluding the number of defaults. Books 1 to 3 produced different results and splits, but one can conclude that loan size, loan amount, age and geographic distribution are important in predicting the splitting of nodes.

CHAPTER 4 CONCLUSION AND RECOMMENDATIONS

4.1 INTRODUCTION

Chapter 3 presented the results from the empirical research conducted on the debtor population in order to determine the demographics of defaulters.

In this chapter, conclusions and a recommendation are given, based on a literature review and empirical study. Evaluations are also made to determine whether the main objectives and sub-objective as identified in chapter 1 have been met.

4.2 CONCLUSIONS

The following conclusions have been reached, based on the empirical findings obtained in this study.

The primary objectives of the study were to determine a default rate of unsecured loans and to analyse the demographics of the defaulting population. The literature identifies various factors that might be involved in defaulting on unsecured loans. In this study, the variables investigated were limited to six distinctive characteristics of the population, namely age, gender, number of defaults, loan size, geographic distribution and number of loans. The total population was analysed and then further divided into the five different debtors' books comprising the total study population.

Profiles of a typical debtor, debtor defaulter and non-defaulter were compiled in order to establish a baseline of these typical groups. The profile of the non-defaulters was determined to achieve the secondary objective of the study. This profile was not analysed further in this study.

4.2.1 Age

The age profile of debtors and defaulters seems to be the same in this study. As per legislation, people younger than 18 years of age are excluded from borrowing money. The younger age group is also eliminated in the vetting process, since these debtors

do not have a fixed income. Economically active age groups are most prominent in the unsecured loan market. In both the debtor and defaulter populations, most participants are between 30 and 40 years old. Older people are once again excluded from unsecured debt because of unemployment or older age in general.

4.2.2 Gender

Females dominate both the debtors and defaulters populations. This is also seen in the breakdown per debtors' book.

4.2.3 Loan size

There is a large variation in loan size in the debtors and defaulters population. The most prominent loan size and default size is R3 000.00. Higher value loans (> R 12 000.00) are almost certain to default within the unsecured debt environment.

4.2.4 Geographic distribution

Gauteng is the most active province in the debtors population and the defaulting population. The geographic distribution is most probably linked to the population size and economic activity of the province in general.

4.2.5 Number of loans

A typical defaulter will only have one unsecured loan, as shown in this study. There is, however, a large number of defaulters with two and three unsecured loans.

The profile of a defaulting debtor is similar to the profile of the debtors' book in general. A profile of an unsecured debtors' book can thus be used as the profile of the defaulting population of the book. Taking all factors into account, it can be said that the profile of a debtors' book will deteriorate to produce a defaulting book with similar characteristics as the original loan book.

4.3 RECOMMENDATIONS

This study evaluates a large number of loans over a long period of time. This can be a strength and a weakness in the unsecured debt environment. The scale of study ensures a population of adequate size for the analysis. When evaluating the results, one can then expect statistically significant differences, but the practical effect might not be significant. In the unsecured lending market it can be expected that loans will default more often over time. This is also seen in this study, where a significant number of the loans defaulted throughout the period. There can be various explanations for this phenomenon, including high interest rates, adverse changes in the general economy, changes in legislation and the general attitude to debt and repayment of debt. The length of the study might skew the default variables over time, since a large portion of the population will become defaulters over time. Results obtained in the study could be useful in the granting phase of unsecured loans. There is a constant search to obtain the perfect profile of a debtor in order to determine the risk of new loans. From the data presented in this study, it can be seen that females in general obtain unsecured loans more frequently than men and the age group 36 is prominent in both the debtor and defaulter population. The loan size is very important and as seen in books 4 and 5, the chances of default in loans bigger than R12 000.00 is very high. It is recommended that the variables analysed in this study be used in conjunction with standard vetting criteria when determining the risk profile of debtors.

4.4 ACHIEVEMENT OF THE STUDY'S OBJECTIVES

4.4.1 Primary objectives

The primary objectives of the study were to determine a default rate of unsecured loans and to analyse the demographics of the defaulting population. These objectives were met through empirical research done in this study. The default rate was proved by empirical research and the demographics as obtained in the empirical research were analysed.

4.4.2 Secondary objective

The secondary objective was to determine the profile of non-defaulters. This was achieved by providing the ultimate profile of a non-defaulter as found in the empirical research. This was also compared to the ultimate profile of a defaulter.

4.5 SUGGESTIONS FOR FURTHER RESEARCH

Further research can explore the findings of this study in more detail. To counter some adverse effects determined in this study, the following modifications are recommended for further research:

- Adjust the time period of the study. Different results might be obtained if the results are analysed on an annual basis instead of a once-off at the end of the period. The defaulting characteristics might change over time and the results obtained in the early stages might give a better understanding of the default behaviour. Unsecured loans tend to default over time and if the time period is too long, the effects leading to the default might erode.
- Incorporate affordability indicators into the study to maximise the results of other non-financial variables e.g. age and geographic distribution.
- Include the initial pay-back term of the loan as a variable.
- Include the deterioration time of the debtors' book into a defaulting book.

Terms:

df: Degrees of Freedom

EDC: External Debt Collector

GDP: Gross Domestic Product

NCA: National Credit Act

NCR: National Credit Regulator

s.d: Standard Deviation

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