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**PERSONAL CREDIT RATING SYSTEM FOR
NON-BANKING SECTOR**

By

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Of
Department of management studies
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A PROJECT REPORT

Submitted to the

FACULTY OF MANAGEMENT SCIENCES

In the partial fulfillment of the requirements
for the award of the degree

Of

MASTER OF BUSINESS ADMINISTRATION

Certificate



KCT Business School
Department of management studies
Kumaraguru College of Technology
Coimbatore – 641006

BONAFIDE CERTIFICATE

Certified that this project titled '**Personal Credit Rating System for Non-Banking Sector**' is the bonafide work of **Mr. P. Rajesh Kannah (Reg No: 71205631042)**, who carried out this research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

Prof. K. R. Ayyasamy

Project guide

Director

Evaluated and Viva Voce conducted on 2/07/07

Examiner 1

Examiner 2



Smartwares

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04th June, 2007

CERTIFICATE

This is to certify that **Mr. P. RAJESH KANNAH** (Reg. No. 05MBA42) who is undergoing Second year MBA in Kumaraguru College of Technology has carried out a Project in our organization titled "**Personal Credit Rating System for Non Banking Sector**" as a part of his curriculum from 18th January, 2007 to 20th April, 2007 and has completed successfully.

He had demonstrated good competency in his work. We observed that during his training period he was highly enthusiastic and took a lot of initiative in accomplishing whatever task assigned to him.

We wish him all the best for future endeavors.

For SmartWares

Dr. A. Selvakumar
Director.

Declaration

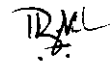
DECLARATION

I hereby declare that this project entitled as “Personal Credit Rating System for Non-Banking Sector” Coimbatore has been undertaken for academic purpose submitted to Anna University in partial fulfillment of the requirements for the award of the degree of Master of Business Administration. The project report is the record of the original work done by me under the guidance of Prof. K. R. Ayyasamy during the academic year 2006-2007.

I also declare hereby, that the information given in this report is correct to best of my knowledge and belief.

Place: Coimbatore

Date : 1/6/07



[P.RAJESH KANNAH]

Acknowledgement

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I express my sincere gratitude to our beloved Correspondent **Prof. Dr. K. Arumugam**, the prime guiding spirit of Kumaraguru College of Technology.

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Abstract

EXECUTIVE SUMMARY (ABSTRACT)

The Project study on “**Personal Credit Rating System for Non-Banking Sector**” is carried out in Coimbatore City.

The main focus of the project is to evaluate the credit worthiness of an individual based on his/her disposable savings and assigning a credit rating and to know about the present methods that is available in non-banking for assessing the credit worthiness of the borrowers and their rating methods. A descriptive study was done, focusing the above said objective.

In western countries loan is provided for an individual based on his credit score, but this concept is not prevalent in India because the Indian system does not encourage the usage of credit cards through out the country as popular as in the western nations. Credit score can be given for an individual based on various parameters like income, financial integrity and financial commitment etc.

The following statistical tools were used for the analysis Chi-square analysis, Correlation analysis, Normal distribution analysis, Regression analysis and Financial discounting techniques.

Having established a credit rating system, the firm could develop modified rating system based on the experience gained on the proposed system.

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Introduction

CHAPTER – 1

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

A credit rating assesses the credit worthiness of an individual, corporation, or even a country. Credit ratings are calculated from financial history and current assets and liabilities. Typically, a credit rating tells a lender or investor the probability of the subject being able to pay back a loan. However, in recent years, credit ratings have also been used to adjust insurance premiums, determine employment eligibility, and establish the amount of a utility or leasing deposit.

A poor credit rating indicates a high risk of defaulting on a loan, and thus leads to high interest rates.

For most people today, credit has become central to their way of life. There are very few who do not have some form of "credit agreement" — be it a mortgage, personal loan, leasing contract or hire-purchase agreement

To assist in lowering the cost of credit, enable faster decision making in the provision of credit, and aid in the avoidance of over-indebtedness of its members' customers.

A Non-Banking Financial Company (NBFC) is a company registered under the Companies Act, 1956 and is engaged in the business of loans and advances, acquisition of shares / stock / bonds / debentures / securities issued by Government or local authority or other securities of like marketable nature, leasing, hire-purchase, insurance business, chit business but does not include any institution whose principal business is that of agriculture activity, industrial activity, sale/purchase/construction of immovable property. A non-banking institution which is a company and which has its principal business of receiving deposits under any scheme or arrangement or any other manner, or lending in any manner is also a non-banking financial company (Residuary non-banking company).

The Indian money market is classified into:

The organized sector (comprising private, public and foreign owned commercial banks and cooperative banks, together known as scheduled banks).

The unorganized sector (comprising individual or family owned indigenous bankers or money lenders and non-banking financial companies (NBFCs). The unorganized sector and micro credit are still preferred over traditional banks in rural and sub-urban areas, especially for non-productive purposes, like ceremonies and short duration loans.

A company incorporated under the Companies Act, 1956 and desirous of commencing business of non-banking financial institution should have a minimum net owned fund of Rs.200 lakh. The company is required to submit its application for registration in the prescribed format along with necessary documents for Bank's consideration.

The Bank issues Certificate of Registration after satisfying itself that the conditions as enumerated in the RBI Act, 1934 are satisfied.

NBFCs are doing functions akin to that of banks, however there are a few differences:

- (i) NBFC cannot accept demand deposits;
- (ii) It is not a part of the payment and settlement system and as such cannot issue cheque's to its customers; and
- (iii) Deposit insurance facility of DICGC is not available for NBFC depositors unlike in case of banks.

Presently, the maximum rate of interest a NBFC can offer is 11%. The interest may be paid or compounded at rests not shorter than monthly rests. The NBFCs are allowed to accept / renew public deposits for a minimum period of 12 months and maximum period of 60 months. They cannot accept deposits repayable on demand.

An unrated NBFC, except certain Asset Finance companies (AFC), cannot accept public deposits. An exception is made in case of unrated AFC companies with CRAR of 15% which can accept public deposit up to 1.5 times of the NOF or Rs.10 crore whichever is lower without having a credit rating.

A NBFC may get itself rated by any of the four rating agencies namely, CRISIL, CARE, ICRA and FITCH Ratings India Pvt. Ltd.

The symbols of minimum investment grade rating of the Credit rating agencies are:

Name of rating agencies	Level of minimum investment grade credit rating (MIGR)
CRISIL	FA - (FA MINUS)
ICRA	MA - (MA MINUS)
CARE	BBB (FD)
FITCH Ratings India Pvt. Ltd.	tA - (ind) (FD)

When a customer fills out an application for credit from a non-bank, store or credit card company, his or her information is forwarded to a credit bureau, along with constant updates on the status of his or her credit accounts, address, or any other changes made since the last time he or she applied for any credit.

This information is used by lenders such as credit card companies to determine an individual's or entity's credit worthiness; that is, determining an individual's or entity's means and willingness to repay indebtedness. This helps determine whether to extend credit, and on what terms.

With the adoption of risk-based pricing on almost all lending in the financial services industry, this report has become even more important since it is usually the sole element used to choose the annual percentage rate (APR).

1.2 REVIEW OF LITERATURE:

One of the fundamental economic problems faced by developing countries is the difficulty in mobilizing funds to increase investment. The level of income is often too low to generate sufficient savings, and the domestic financial system often does a poor job of directing those funds back into domestic capital formation. This makes access to international capital markets an important resource for obtaining funds to raise the level and accelerate the pace of investment and growth. In order to gain access, developing countries must first obtain a favorable rating of their credit worthiness by one or more rating agencies. A strong credit rating will play a major role in determining the cost and availability of credit flows, and the failure to maintain a strong rating will possibly lead to reversal of capital flows, a disruption of the financial system and overall economic down turn. It has been not just the likelihood, but the fact, of such financial crisis in many parts of the developing world that has focused so much attention on the role played by credit rating agencies in international capital markets and the world economy.

Sovereign ratings aim at indicating the capacity and willingness of the government to repay the debt obligations in full and on time. Imbued with in this objective are two objectives, which the rating agencies aim at achieving. The first one is to assess the credit worthiness of the government, meaning assessment of sovereign risk. The second one is to assess the creditworthiness of the debt private creditors advanced in the form of bills, bonds, etc. The three big rating agencies are S&P's, Moody's and Fitch Ratings.

A corporate credit ratings reflects the credit rating agencies' opinion of the credit worthiness of a particular company as regard a security, or obligation or the likelihood that debt will be repaid. Credit ratings have a great significance in the market, and this sometimes gives the agencies a brutal power.

Personal credit rating is done using a set of parameters which are used to judge the credit worthiness of an individual. The final rating is given based on the score an individual gets in each of these parameters.

1.3 OBJECTIVES OF THE STUDY:

Primary Objective:

To evaluate the credit worthiness of an individual based on his/her disposable savings and hence assigns a credit rating.

Secondary Objective:

To know about the present methods that is available in non-banking for assessing the credit worthiness of the borrowers and their rating methods.

1.4 STATEMENT OF THE PROBLEM:

In western countries loan is provided for an individual based on his credit score which is assessed on the basis of his income and his history of repaying of bills. But this scenario is not prevalent in India because the Indian system does not encourage the usage of credit cards through out the country as popular as in the western nations. Credit score can be given for an individual based on various parameters like income, financial integrity and financial commitment etc.

1.5 SCOPE OF THE STUDY:

When you attempt to rent an apartment or house, the landlord will often check your credit report to see if you are likely to pay the rent on time. Negative entries on your personal credit report may prompt the landlord to deny you that place to live.

When you apply for a job, your prospective employer may also check your credit report to gain insight into your character, and what type of employee you may be. A good credit rating enables you to take your financial credentials anywhere in the world, to conduct business or purchase the products you want and need. Without it, you would find it almost impossible to do business with anyone that you didn't know personally. Employers, utility service providers, among many others, use credit scores to evaluate whether to offer their services to individuals, and uses for the credit score continue to expand.

Individuals with higher credit scores are offered different services than those with lower scores. Individuals with lower credit scores are targeted with sub prime loans with higher interest rates.

Two main criteria for rating agencies are

1) The Probability of default

One of the first number that a rating agency looks at is the probability of default that gives a good measure of how stable the assets of the leading firm. High default rates are a drag on ratings whereas low defaults ratings help push ratings higher.

2) The Recovery Rate

While the probability of default is important, it also matters how much is recovered after a default. If one asset has a 5% default rate but a 0% recovery rate, but another asset has a 10% default rate and a 70% recovery rate, most likely the second asset group will have a higher rating than the first.

1.6 METHODOLOGY:

1.6.1 Type of study

The type of study is descriptive in nature. This research is usually a fact-finding approach. The major purpose of descriptive research is description of the state of affairs as it exists at present. The main characteristic of this method is that the researcher has no control over the variables. He can report only what has happened or what is happening.

The present study “Personal Credit Rating System for Non-Banking Sector” is a study where the researcher has no influence over the variables. Hence the study is descriptive in nature. The study is based on primary as well as secondary data.

Primary data:

The data is obtained from the survey conducted on a select of individuals.

Secondary data:

The secondary data required were sourced from,

Internet

Journals and Newspapers

Referred Standard Books

1.6.2 Sampling design

The sampling design is stratified random sampling. The whole population is divided into disjoint strata/groups. Then all the members of the population are first assigned to specified strata or groups. On the basis of some characteristics thereafter, a simple random sample is drawn from each stratum of a specified number. The individuals selected from each stratum taken together constitute the sample from the population as a whole.

Stratification does not mean absence of randomness. All it means is that the population is first divided into certain strata that are mutually exclusive and collectively exhaustive. A stratum, as is clear, is a sub population which is more homogenous than the complete population. The grouping is done based on criteria, which is closely correlated to the main objective of the study such that there homogeneity within strata, heterogeneous between strata.

The population under study is divided into 4 strata on the basis of monthly income as shown below:

Income Rs.5000 & less

Rs.5001-10000

Rs.10001-25000

Rs.25001-100000

1.6.3 Method of data collection

Pilot study was conducted for refining the questionnaire. The Coimbatote city was divided into 3 major areas representing low income, middle income and higher income. Using the statistical analysis a sample size 50 for each of the above category was obtained. The selected households were surveyed with the initial questionnaire designed. Based on the pilot study, the questionnaire was redesigned to get data from a larger sample. The questionnaire is shown in the appendix. This sample size was determined by using the statistical technique viz. estimation of sample size on the basis of standard error of the pilot study result. The collected data's were analyzed.

1.6.4 Tools of Analysis

The following statistical tools were used for the analysis:

- Chi-square analysis
- Correlation analysis
- Normal distribution analysis
- Regression analysis
- Financial discounting techniques

Chi-square analysis:

This test is used for testing for association between two variables. It helps us to understand whether a significant difference exists between observed number of objects or responses and an expected number.

Correlation analysis:

This analysis measures the magnitude and direction of relationship between two study variables. It ranges from -1 to +1; the sign indicates the directional of relationship, while the value gives the strength of association.

Normal distribution:

It is a symmetrical bell-shaped statistical distribution where the mean, the median and the mode all have a same value. If the surveyed data follows a normal distribution, then such data are valid for many statistical inferences.

Regression analysis:

This is used to determine the functional relationship between a dependent variable and a host of predicting variables.

Financial discounting technique:

The process of determining present value of a future payment or a series of future payments is termed as discounting. The compound interest rate used for discounting cash flows is called a discount rate. The present value of a future cash inflow is the amount of current value used by the decision maker.

1.7 LIMITATIONS OF THE STUDY:

The following are the limitations of the study:

- The study is limited only to Coimbatore city
- The scoring should be updated periodically based on the individuals' record and firm's experience.
- Reliability and details of individuals are accurate if to the revealed level of the respondents.
- Difficulty of getting access to some important data due to its confidential disclosure.

1.8 CHAPTER SCHEME:

CHAPTER 1:

This chapter describes the background of the study, review of literature, objective of the study, statement of the problem and methodology used for the study.

CHAPTER 2:

This chapter describes the history of the organization, the objective of the organization, its vision, mission, product profile, company profile, along with the core business of the organization.

CHAPTER 3:

This chapter describes the credit rating system prevailing in western countries and the credit rating agencies in India.

CHAPTER 4:

This chapter describes methodology of collecting data and use of various statistical tools that were used for the analysis.

CHAPTER 5:

This chapter deals with the conclusion and suggestions of the study.

Organizational Profile

CHAPTER – 2

ORGANIZATIONAL PROFILE

2.1 HISTORY OF THE ORGANIZATION:

SmartWares was established in 1993 in Canada by a group of technocrats to provide solutions and services in the Information Technology area to the small and medium business segments. Subsequently, in 1997, an offshore development and support facility was established in India.

Excellent infrastructure, strong financial backup, expert managerial and technical human resources along with strong strategic partnership with industry leaders enables us to offer unparalleled value to our customers. The company's mission is to provide complete, reliable, high quality, value added solutions and services to enterprises at affordable cost.

The solutions and services are designed to support the business strategy of our clients with the use of innovative technologies, best of breed components and best practices. With a strong understanding of business combined with the extensive hands-on experience in a number of hardware/software platforms and network technologies, the company is in a position to design and implement comprehensive business solutions to meet client needs.

The company takes a systematic approach by carefully crafting a solution strategy that is consistent with the client's overall business strategy. As part of this process, the client's long term goals will be explored and existing systems will be evaluated before options are identified and assessed. This ensures that the company's recommendations and implementation will be consistent with current and future strategic requirements of the clients.

The company's services cover the entire range of business process automation requirements from conducting feasibility studies to project formulation to resource planning to project management to implementation to documentation and finally training.

VISION: "To be the Partner of Choice to Global Customers"

MISSION: "To provide complete, reliable, high quality, value added solutions and

2.2 ALLIANCES OF SMARTWARES

The firm has strategic association with the following firms:

North Eastern Council - NEC

NEC is a 40 Billion dollar company with world wide presence. SmartWares has been selected to be their System Integration and Implementation Partner for their Open Mission Critical Systems (OMCS) and solutions architecture.

Reliance Infocomm

Reliance Infocomm is a pioneering enterprise in the IT and Telecom domain. SmartWares is a solutions development partner for mobile application development.

Kumaraguru College of Technology (KCT)

Through the industry-institution partnership, SmartWares's Training Division has set up a training division at Coimbatore, India. In the process SmartWares got associated with leading institutions of international/ national repute. Established in 1984, Kumaraguru College of Technology (KCT) has been selected as the BEST Engineering institution in the country by Indian Society of Technical Education (ISTE) for the year 2004. SmartWares provide software solutions to many clients.

The following are few representatives:

NEC (Financial Services Division) - Japan

Maison Viau - Canada

IEM Inc. - Canada

InterTech Inc. - Canada

Clarklift - Canada

Canada Trail Foundation - Canada

DBK Espana S.C. – Spain

Sakthi Finance Ltd. - India

ABT Industries Ltd. – D`airy Division - India

ABT Industries Ltd. - Soft Drinks Division – India



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2.3 SOLUTIONS AND DIVISIONS

Software solution division

Software development is the core business activity of the company. Teams of highly qualified professionals develop both systems and application software under Mainframe, IBM AS/400, and Unix/Linux and Windows platforms. The company with its dedicated team and a proven project methodology is in a position to provide solutions for the entire spectrum of business requirements. Project assignments are undertaken either as on-site or off-shore or BOT (Built-Operate-Transfer) basis. Currently, the Software Solutions Division is primarily working in the following domains:

- Customized Application Development
- Client-Server Technology Extension to Web Environment
- Conversion and Migration from one Platform to another
- Industrial Automation Solutions
 - Data Acquisition Packages
 - Process Monitoring Packages
 - Process Control Applications
- Geographic Information System (GIS) Applications

SERVICES DIVISION

The company's offshore services based on flexible, yet proven engagement models offer huge cost savings, time optimization and talented technical resources in a minimal risk environment.

The company offers a wide spectrum of services to our clients.

- Custom Software Development
- Testing & Independent Verification and Validation Services
- Support and Maintenance
- Product Development
- Product Reengineering
- Product Implementation
- Compliance Services
- Technical Documentation

FINANCIAL SERVICES

Irrespective of the size and location, financial services organizations worldwide are under tremendous competitive pressures. Deregulation, globalization and stricter and more transparent accounting requirements are some of the compelling reasons for these phenomena. To meet these challenges, today's financial institutions increasingly depend on IT.

The company experience and capabilities in this segment cover all of the industry needs, including capital markets solutions, strategic outsourcing, integration and processing services, application maintenance and outsourced and custom development services.

Offerings:

Banking Software:

The company offers a comprehensive suite of banking software components and solutions that make business process change practical.

Software Services:

The company have participated and delivered some of the largest systems implementations and conversions in the financial services industry in Japan.

Systems Integration:

The company has undertaken integration of processes and technology within and across financial services enterprises.

Business Process and IT Outsourcing:

The company provides a full range of BPO services to banks and consumer finance companies, including high volume form processing, data capture and credit analysis.

The company's solutions and services in this segment offer faster adaptability, real-time security, availability, data integrity and full accountability.

COMPLIANCE SERVICES

Worldwide, the regulatory environment is rapidly evolving and is becoming more strident with respect to corporate governance. Under these dynamic circumstances, achieving and sustaining compliance in a cost effective manner has emerged as major challenge for corporate. One of the key elements for meeting

As an independent compliance service provider, we have capability to work with multiple team and multiple vendors thereby guaranteeing the company's clients best of breed practices and processes. We have certified practitioners with domain knowledge as well as field experience on Industrial Best Practices. As such, they can quickly adapt and be productive in any given environment.

Financial Controls:

Recent Corporate Governance Requirements (such as SOX, J-SOX, etc.) require enterprises to provide complete and accurate representation of the organizations' financial state to all stakeholders.

In this domain, our team, made up of combination of Onsite / Offshore resources, has worked with big 4 and other auditing firms. Based on their experiences, the company can provide a cost effective road map to clients on how to invest in SOX compliance in an 'n' step process.

The company's Risk based compliance methodology addresses:

- Sustainability
- Optimization of controls
- Standardize controls
- Automating controls
- Optimize transactional systems environment

IT SERVICES

- System Integration
- Configuration Management
- Independent Verification and Validation
- Vendor Management

BPO SERVICES

- Data Entry, Data Capture and Data Processing
- Engineering Services
 - CAD Services - Drawing (2D, 3D) Creation and Conversion
 - CAE Services – GIS and Component Design and Analysis
- Technical Document Services – Technical Document Preparation and Translation

Data Entry, Data Capture and Data Processing:

The company has dedicated Content Analysis cell has the capability to undertake a variety of data entry, automated data capture, indexing, and analysis and conversion services. The cell with its own dedicated infrastructure and resources has extensive experience in converting massive amount of data from a variety of sources (from paper based to digital content) into desired electronic formats such as XML, HTML, PDF thereby enabling delivery through a variety of channels.

Forms Processing according to a defined workflow, e-books, e-newspapers are some the work currently being done by the cell.

CAD Services:

CAD drawing (2D/3D) creation and conversion using AutoCAD 2000, Autodesk Mechanical Desktop, Pro/Engineer 2000i or IDEAS packages is also undertaken on volume basis. Again, a separate cell with high-end equipments such as wide-format scanner, ink-jet plotter and qualified operators has been assigned for this purpose.

CAE Services:

Computer aided design and analysis of mechanical and plastic components as well as civil engineering structures are undertaken on project basis. Towards this end, Finite Element Method (FEM) packages and high-end CAE tools such as Pro/Engineer, IDEAS, STARDYNE, ANSYS and STADD-III are used.

Technical Document Services:

Because of the past and ongoing project requirements, the company has established in-house a well-qualified pool of technical document writers. This cell has successfully completed technical documentation translations from English to other languages in the recent past.

2.4 PRODUCTS PROFILE

SMART – EiRP

EiRP (Educational Institution Resource Planning) is the most sophisticated and comprehensive computer based educational institute administration system in the market today. It enables seamless integration of all information that flows through an institution. It provides secure, anytime, anywhere access to relevant information to authorized users through standard Internet Browser. Built on the latest internet development platform, it is easily scalable from Schools to Colleges to Universities.

Highlights:

- Enables Administrators to gather, organize, distribute and act on critical information.
- Secure - Encrypted Database Security and Extensive Access Control features are built-in.
- Web Enabled – Easy of maintenance and anytime, anywhere access.
- Cost-effective – Unlimited user license within a campus.
- Modular - Architected to enable effortless addition and deletion of features in the future.
- Data Mining - Complex queries are easily handled to relevant data.
- Data Integrity - No Duplication of effort in Data Entry.
- Customizable Reports - To meet statutory as well as ISO 9001 requirements.
- Multi-Location (Campus) – Distributed campuses can be managed centrally.
- Multi-Currency – Financial statements and receipts can be made in multiple currencies.
- Instant Alerts - Automatic notification through e-mail or SMS of relevant information to relevant people (Management, Faculty, Parents, Students).
- Customizable - User Interface can be customized by each user.

SMART - LINSYS

Smart-LINSYS is a comprehensive computer based library administration and automation system with seamless integration of all information that flows through a library. It offers secure access to relevant information to relevant people with configurable security and access profiles. Using standard Internet Browser, it provides anytime, anywhere access to authorized users through internet and intranet. Built on the latest internet development platform, it is easily scalable.

Highlights:

- It generates customizable reports to meet statutory as well as ISO 9001 requirements.
- All aspects of library's day-to-day activities are monitored in a time and cost effective manner.
- Web Enabled.
- Modularized architecture to enable effortless addition and deletion of features in the future.
- Complex queries and reports can be handled.
- Multi-Language Capability.
- Multi-Location Capability.
- Automatic notification of relevant information to relevant people through e-mail and/or SMS.
- Extensive Data Security through encryption and Access Control.
- No Duplication of effort in Data Entry.
- User Interface can be customized by each user.
- Usage Statistics.
- Additional extensions and interfaces to accommodate Smartcard Applications and Mobile phone Data access (SMS) are built-in so that future extension of services can be done without altering the existing system.

Macro and Micro Analysis

CHAPTER – 3

MACRO AND MICRO ANALYSIS

MACRO:

In countries such as the United States, an individual's Credit history is compiled and maintained by companies called credit bureaus. In the United States, credit worthiness is usually determined through a statistical analysis of the available credit data. A common form of this analysis is a 3-digit credit score provided by independent financial service companies such as the FICO® credit score. (The term, a registered trademark, comes from Fair Isaac Corporation, which pioneered the credit rating concept in the late 1950s) or by the bureaus themselves.

One's credit score, along with their credit report, affects one's ability to borrow money through financial institutions such as banks.

In Canada, the most common ratings are the North American Standard Account Ratings, also known as the "R" ratings, which have a range between R0 and R9. R0 refers to a new account; R1 refers to on-time payments; R9 refers to bad-debt.

Credit ratings are determined differently in each country, but the factors are similar, and may include:

- ❖ ability to pay a loan
- ❖ interest
- ❖ amount of credit used
- ❖ saving patterns
- ❖ spending patterns
- ❖ Payment record
- ❖ Control of debt

A lender could prefer a lower score borrower with favorable factors over a higher score borrower with negative factors. Credit scores generally range from the mid 300s to the mid 800s. Different products and lenders use different guidelines for what is an acceptable score. Also, there will usually be differences in the scores calculated by each of the three credit bureaus. Lenders will often use the middle of your three scores.

Above 730 Excellent credit

700 - 729 Good credit

670 - 699 Lender will take a closer look at your file

585 - 669 Higher risk; you will not be eligible for the best rates and products. Credit products may not be available.

Below 585 Credit options will be limited or not available. Lender will need to consider other information in your application.

The individual's credit score is determined by measuring the likelihood of default. So credit scores are generated using factors that have been found to predict credit risk. These factors are not weighted evenly and several minor instances may indicate a higher risk than one major, but isolated, credit problem.

There are five main categories of credit information which impact the individual's credit score (listed in decreasing order of importance):

Late payments, delinquencies, bankruptcies:

Past inability to pay on time will hurt his/her chances of getting credit in the future. More recent problems will be counted more heavily than those in the past.

Outstanding debt:

The more debt one has, the greater the risk that he or she will not be able to keep up with the payments

Length of credit history:

With a short track record it is harder for a lender to assess creditworthiness.

New applications for credit (inquiries):

Frequent credit checks by lenders may indicate that a borrower is looking to increase his or her amount of debt.

Types of credit in use:

Some types of credit, including credit cards, provide the individual with a credit line greater than the amount he/she has already borrowed. The more credit

Credit Rating Agencies

The modern rating system dates back to 1909 when John Moody started rating US railroad bonds. Currently, four rating agencies dominate the international scene. They are Moody's, Standard and Poor's, Fitch IBCA and Duff & Phelps. While normally CRAs assign a rating on the request of an issuer, there are occasions when unsolicited ratings are assigned, and in many such cases, the fact that they are unsolicited is made explicit with an asterisk.

While the rating of corporate bonds started in early twentieth century, sovereign ratings represent a relatively new line of business for the agencies. The first industrial country to be rated was France, by S&P in 1959. Both Moody's and S&P rated a non-industrial country, namely, Venezuela as recently as October 1977. Fitch IBCA entered the business of sovereign rating only in 1975.

In cases where sovereign does not seek a rating, but a corporate entity of such a country seeks a rating, CRAs do assign an implicit sovereign rating.

These companies, most still active today, developed scoring systems that told creditors about the creditworthiness of the borrowers. Each rating agency has its own nomenclature or "credit grade" that ranks the default risk of borrowers. The scale begins at the highest quality ratings, such as AAA, with very low probability of default, and descends to risky or "speculative" ratings, such as BB, where the risk of default is high.

MICRO:

In India the four main credit rating agencies are CRISIL, ICRA, DCR and CARE.

The Credit Rating Information Services of India Limited (CRISIL) initiated the concept of credit rating in India. CRISIL was established in 1987 and started operations in January 1998. Currently, four rating agencies are in operation in India, rating bonds. All the four Indian rating agencies have tie ups/alliances with international rating agencies - CRISIL with S&P, ICRA with Moody's, CARE with Fitch IBCA and DCR (India) Pvt. Ltd. with Duff & Phelps.

ICRA Limited (an Associate of Moody's Investors Service) was incorporated in 1991 as an independent and professional company. ICRA is a leading provider of

With the growth and globalization of the Indian capital markets leading to an exponential surge in demand for professional credit risk analysis, ICRA has been proactive in widening its service offerings, executing assignments including credit ratings, equity gradings, specialized performance gradings and mandated studies spanning diverse industrial sectors.

ONICRA, being the first to introduce the concept of individual credit rating, has conducted in – depth, research into all aspects of the behavior of credit seekers and has conducted comprehensive rating systems for various types of credit extension. These systems take into account and analyze a vast range of parameters, which have been found to influence an individual's credit behavior.

The basic methodology followed while formulating the mathematical framework for rating of individuals and small businesses is the same. A top-down approach of parameter decomposition has been followed. This entails decomposing parameters into their sub-parameters, upon which they are dependent, through several levels, until independent, quantifiable parameters are arrived at. The research group in the organization constantly monitors various parameters, the environment, and economic parameters in order to keep the model up-to-date in line with the fast changing financial and economic scenario.

Credit Analysis & Research Ltd. (CARE), incorporated in April 1993, is a credit rating, information and advisory services company promoted by Industrial Development Bank of India (IDBI), Canara Bank, Unit Trust of India (UTI) and other leading banks and financial services companies. In total CARE have 14 shareholders. CARE assigned its first rating in November 1993, and upto March 31, 2006, had completed 3175 rating assignments for an aggregate value of about Rs 5231 billion. CARE's ratings are recognized by the Government of India and all regulatory authorities including the Reserve Bank of India (RBI), and the Securities and Exchange Board of India (SEBI). CARE has been granted registration by SEBI under the Securities & Exchange Board of India (Credit Rating Agencies) Regulations, 1999.

The rating coverage has extended beyond industrial companies, to include public utilities, financial institutions, infrastructure projects, special purpose vehicles, state governments and municipal bodies.

Analysis and Interpretations

CHAPTER 4

ANALYSIS AND INTERPRETATION

Credit scoring models are developed by analyzing statistics and picking out characteristics that are believed to relate to creditworthiness of individuals. Credit scoring models compute the individual's score primary from information contained in his credit report. The models might also take information from credit applications into consideration, including his occupation, length of employment, and whether he owns a house.

Sample selection:

The sample is selected using the following procedure:

The sample size was known from the pilot survey, Coimbatore city was divided into 3 major areas representing low, middle and high income respectively. All the above areas street names were written with continuous serial number to the houses. Then the samples of those who are considered to be the respondents were selected by applying random numbers to those houses. Then the survey was conducted to those samples.

Analysis:

The following statistical tools were used for the analysis:

- Chi-square analysis.
- Correlation analysis.
- Normal distribution analysis.
- Regression analysis
- Financial discounting techniques.

Chi-square analysis:

This test is used for testing for association between two variables. It helps us to understand whether a significant difference exists between observed number of objects or responses and an expected number. If the null hypothesis is true, then the sampling distribution of the chi-square can be closely approximated to a continuous

To identify the variables those are having a strong association with the base variables viz. income and the disposable savings. It is formulated there is no relationship between income and the following:

- i) Occupation
- ii) Other income
- iii) Ownership of land
- iv) Possession of card holdings
- v) Subscription of financial saving instruments (LIC, Medyclaim, Share market, Recurring deposit, Chit fund)
- vi) Giving bridge loan.

The chi-square test was used at 5% level of significance to validate the above hypothesis. The chi-square test is formulated and test as described below:

Chi-square for income vs. occupation:

Null hypothesis:

H₀: There is no relation between income and the occupation.

Alternative hypothesis:

H₁: There exist a relationship between income and relationship.

Level of significance: 5%.

Testing of hypothesis:

INCOME	<5000	5001-10000	10001-25000	25001-100000	TOTAL
SERVICE	28	10	12	5	55
SELF EMPLOYED	26	14	5	7	52
TOTAL	54	24	17	12	107

S.No	F _o	F _e	(F _o - F _e)	(F _o - F _e) ²	(F _o - F _e) ² / F _e
1	28	27.76	0.24	0.058	0.0021
2	10	12.34	-2.34	5.48	0.444
3	12	8.74	3.26	10.63	1.22
4	5	6.17	-1.17	1.37	0.222
5	26	26.24	-0.24	0.06	0.0023
6	14	11.66	2.34	5.48	0.47
7	5	8.26	3.26	10.63	1.29
8	7	5.83	1.17	1.37	0.235

$$X_o^2 = \sum (O_i - E_i)^2 / E_i$$

$$= 3.886$$

$$X_e^2 = 7.815$$

Degrees of freedom: 3

Inference: Since $X_o^2 < X_e^2$, we accept our null hypothesis. Therefore there is no relationship between income and occupation.

Similarly, chi-square test is performed to all the other variables and the results are summarized. The summarized results of chi-square tests

Variable	Calculated chi-square value	Degrees of freedom	Table value	Test Results
Occupation	3.875	3	7.815	Accepted
Other income	23.913	9	16.919	Rejected
Ownership of land	5.421	3	7.815	Accepted
Ownership of house	3.633	3	7.815	Accepted
Subscription of LIC	15.755	3	7.815	Rejected
Subscription of mediclaim	18.421	3	7.815	Rejected
Investing in share market	18.607	3	7.815	Rejected
Investing in chit fund	2.011	3	7.815	Accepted
Investing in Recurring deposit	8.477	3	7.815	Rejected
Possession of credit card	20.347	3	7.815	Rejected
Possession of debit card	38.439	3	7.815	Rejected
Bridge loan	2.561	3	7.815	Accepted

Inference:

From the above, we could infer that income is closely related or influences other income, Subscription of LIC, Subscription of mediclaim, investing in share market, investing in Recurring deposit, Possession of credit card and Possession of debit card.

However, it is inferred that nature of occupation, ownership of land, ownership of house, investing in chit fund and availing of bridge loan do not have

Normal distribution:

It is a symmetrical bell-shaped statistical distribution where the mean, the median and the mode all have a same value. If the surveyed data follows a normal distribution, then such data are valid for statistical inferences. The normal distribution should follow:

$$\bar{x} \pm 1\sigma = 65\%$$

$$\bar{x} \pm 2\sigma = 95\%$$

$$\bar{x} \pm 3\sigma = 99.73\%$$

The steps in normality are as follows:

1) To find the Mean of income:

Monthly income	Mid value (x)	No. of samples (b)	x*b
0-5000	2500	54	1,35,000
5001-10000	7500	24	1,80,000
10001-25000	12500	17	2,12,500
25001-100000	62500	12	7,50,000
		$\Sigma b = 107$	$\Sigma x*b = 12,77,500$

Therefore, Mean = $1277500/107$ $\bar{x} = 11939$

2) To find the Standard deviation σ :

$(x - \bar{x})^2$	$(x - \bar{x})^2 * \text{no. of samples}$
$(2500 - 11939)^2$	$89094721 * 54 = 4811111934$
$(7500 - 11939)^2$	$19704721 * 24 = 472913304$
$(12500 - 11939)^2$	$30924721 * 17 = 525720257$
$(62500 - 11939)^2$	$2556414721 * 12 = 3.067697665 \times 10^{10}$
$\Sigma(x - \bar{x})^2$	$3.648672515 \times 10^{10}$

$$\frac{\Sigma(x - \bar{x})^2}{n} = \frac{3.648672515 \times 10^{10}}{107}$$

$$\sigma^2 = 340997431.3$$

$$\frac{\sqrt{\Sigma(x - \bar{x})^2}}{n} = 18466$$

3) To find 3σ levels:

$$\bar{x} \pm 1\sigma = -6527 \text{ to } 30405 = (95/107)*100 = 88\%$$

$$\bar{x} \pm 2\sigma = -24993 \text{ to } 48871 = (95/107)*100 = 88\%$$

$$\bar{x} \pm 3\sigma = -43459 \text{ to } 67337 = (107/107)*100 = 100\%$$

Inference: The above results infer that the data is not following the normal distribution.

Regression analysis:

Regression is the appropriate method of analysis when the research problem involves a single metric dependent variable presumed to be related to two or more metric independent variables. The multiple regression analysis predicts the changes in the dependent variable in response to changes in the independent variables. For example, monthly expenditure (dependent variable) of a family might be predicted from information of the family income, its size and the age composition of the family members (independent variables).

To find the regression coefficient r:

The regression analysis is performed to know the relation between the forced saving and the subscription of saving instruments. Calculation is shown in table.

$$\text{Sum}(x-\bar{x})^2 = 38497165888$$

$$\text{Sum}(y-\bar{y})^2 = 140.0186916$$

$$\text{Sum}(x-\bar{x}) * (y-\bar{y}) = 598619.1589$$

$$r = \frac{\text{sum}(x-\bar{x}) * (y-\bar{y})}{((\text{sum}(x-\bar{x})^2 * \text{sum}(y-\bar{y})^2)^{0.5}}$$

Where,

x = savings and y = subscription

$$r = 0.25$$

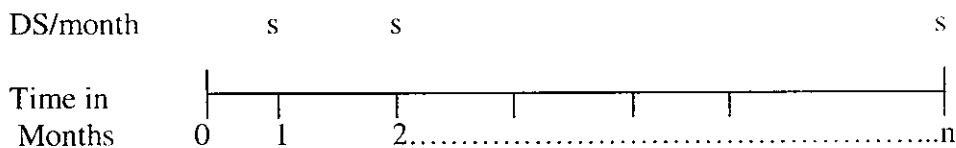
Inference:

It is inferred that exist only less relationship between the disposable saving and subscription of saving instrument.

Present value method:

The process of determining present value of a future payment or a series of future payments is termed as discounting. The compound interest rate used for discounting cash flows is called a discount rate. The present value of a future cash inflow is the amount of current cash that is of equivalent value to the decision maker.

Let 'DS' denote the amount of disposable savings per month. If an individual needs loans for 'n' months, the present value of his future disposable savings is



$$\text{Present value of } s: p = s (1+i)^{-n}$$

Where, 'i' is the interest chargeable on the loan expressed in per rupee per month.
(Example if interest is 15% compounded on monthly basis, $i=0.0125$)

Procedure of analysis:

The total number of samples for the banking sector is 193. Since income is one of the major parameter which influence the repaying capacity of an individual, the whole data is divided into three categories in which 42 data belong to the lower income group, 63 belong to the middle income group and 88 in the higher income group. The expenses for an individual are arrived by taking into consideration the following variables:

Assume

E is the expenses described by

X_1 is the expenditure for an individual

X_2 is the expenditure for spouse

C is the total expenses for the number of children in the family

M is the miscellaneous expenses leading to

$$E = X_1 + X_2 + C + M$$

$$C = \{c_1, c_2, c_3, c_4, c_5\}$$

The total expense per month is calculated by making certain assumptions as follows:

- The minimum daily consumption expense for an individual in a family is Rs. 750
- The minimum expense for a school going child is Rs. 750 (Rs. 250 for fees and Rs.500 for food)
- The minimum expense for a college going child is Rs. 3250
- The miscellaneous expense is Rs. 1000
- The rent for the house is taken as 25% of his basic pay

Hence savings obtained as,

$$\text{Savings} = \text{Total income} - \text{sum of all Expenses} \dots\dots\dots (1)$$

The disposable savings is assumed to be the amount which the individual spends on forced savings like loan dues, life insurance premium, mediclaim premiums, and investment in recurring deposits, share market instruments etc...

The disposable savings is obtained by deducting the forced savings from the savings obtained from (1) above.

$$\text{Disposable savings} = \text{savings} - \text{forced savings} \dots\dots\dots (2)$$

The forced savings is the amount, which an individual can utilize for paying the monthly dues of a fresh loan. From the disposable savings, the present value is calculated for which the ratings are given.

Conclusion & Suggestions

CHAPTER 5

CONCLUSION AND SUGGESTIONS

Rating could be given based on the following assumptions:

Case 1: Shorter duration credit (≤ 24 months).

A credit limit of:

75% of the present value with 'AAA' rating

85% of the present value with 'AA' rating

95% of the present value with 'A' rating and

100% of the present value with 'D' rating

The present value calculations for the sampled survey is shown in the appendix

For example:

The details of the respondent No.72 in Table No-3 is shown below and the rating categories are as follows:

Total income per annum is Rs. 1, 50, 000

Total expenses per annum is Rs. 1, 30, 500

Total savings per annum is Rs. 19, 500

As per the equation (2) the disposable savings per annum is Rs. 9,750

The present value of Rs. 9,750 for 2years at the rate of 15 % is Rs.15, 853.

When the loan amount is Rs. 11,889- AAA

When the loan amount is Rs. 13,475 - AA

When the loan amount is Rs. 15,060 - A

When the loan amount is Rs. 15,853 - D

Case 2: Longer duration credit (> 24 months).

A credit limit of:

60% of the present value with 'AAA' rating

70% of the present value with 'AA' rating

80% of the present value with 'A' rating and

90% of the present value with 'D' rating

The same illustration can be considered for a longer duration say 10 years and the rating categories are as follows:

The present value of Rs. 9,750 for 10 years at the rate of 15 % is Rs.48, 935

When the loan amount is Rs. 29,361 - AAA

When the loan amount is Rs. 34,254 - AA

When the loan amount is Rs. 39,148 - A

When the loan amount is Rs. 44,041 - D

The ratings could be interpreted as under.

Rating	Interpretation of the rating
AAA	Highest credit quality, exceptionally strong capacity for timely repayment, no risk.
AA	Good credit quality, strong capacity for timely repayment but may be affected by adverse changes, risk is very low.
A	Fair credit quality, risk is present.
D	Default, high risk.

The interest rate also could vary according to the credit rating. One percentage variation can be graded as shown under;

Rating	Interest rate
AAA	PLR
AA	PLR+ 1%
A	PLR+2%
D	PLR+3%

PLR - Prime Lending Rate.

Suggestion:

Having established a credit rating system based on the experience gained on the proposed system, the firm can review and modify the rating system.

Table No - 1: Savings vs. Subscription Table

$x = \text{Savings}$

$y = \text{Subscription}$

$a = \text{sum } y / 107$

$b = \text{sum } xy / \text{sum } x^2$

$y = a + bx$

Sample No	Savings	Subscription	Savings ²	Savings* Subscription	Y
1	-375	3	140625	-1125	1.690671061
2	1000	3	1000000	3000	1.762571874
3	3500	3	12250000	10500	1.893300624
4	2000	3	4000000	6000	1.814863374
5	18500	3	342250000	55500	2.677673124
6	250	2	62500	500	1.723353249
7	1375	2	1890625	2750	1.782181186
8	1750	2	3062500	3500	1.801790499
9	-1875	2	3515625	-3750	1.612233811
10	-1875	2	3515625	-3750	1.612233811
11	2875	2	8265625	5750	1.860618436
12	4250	2	18062500	8500	1.932519249
13	-1125	1	1265625	-1125	1.651452436
14	-1125	1	1265625	-1125	1.651452436
15	1000	1	1000000	1000	1.762571874
16	1125	3	1265625	3375	1.769108311
17	-375	2	140625	-750	1.690671061
18	1750	2	3062500	3500	1.801790499
19	-1125	2	1265625	-2250	1.651452436
20	8125	2	66015625	16250	2.135148811
21	-3625	1	13140625	-3625	1.520723686
22	-375	1	140625	-375	1.690671061
23	1125	1	1265625	1125	1.769108311
24	375	1	140625	375	1.729889686
25	-2875	2	8265625	-5750	1.559942311
26	-1125	2	1265625	-2250	1.651452436
27	2875	2	8265625	5750	1.860618436
28	2750	2	7562500	5500	1.854081999
29	-1125	1	1265625	-1125	1.651452436
30	-2875	1	8265625	-2875	1.559942311
31	-2875	1	8265625	-2875	1.559942311
32	-375	1	140625	-375	1.690671061
33	375	1	140625	375	1.729889686
34	1000	1	1000000	1000	1.762571874
35	-375	1	140625	-375	1.690671061
36	11375	1	129390625	11375	2.305096186
37	-1125	0	1265625	0	1.651452436
38	-1125	0	1265625	0	1.651452436

Sample No	Savings	Subscription	Savings ^ 2	Savings * Subscription	Y
					1.729889686
42	375	0	140625	0	1.762571874
43	1000	0	1000000	0	1.684134624
44	-500	0	250000	0	1.422677124
45	-5500	0	30250000	0	1.762571874
46	1000	0	1000000	0	1.762571874
47	1000	0	1000000	0	1.762571874
48	1000	0	1000000	0	1.899837061
49	3625	0	13140625	0	1.821399811
50	2125	0	4515625	0	1.860618436
51	2875	0	8265625	0	1.814863374
52	2000	0	4000000	0	1.814863374
53	2000	0	4000000	0	2.416215624
54	13500	0	182250000	0	2.082857311
55	7125	4	50765625	28500	2.043638686
56	6375	3	40640625	19125	2.736501061
57	19625	3	385140625	58875	2.435824936
58	13875	3	192515625	41625	2.376996999
59	12750	2	162562500	25500	2.416215624
60	13500	3	182250000	40500	2.122075936
61	7875	3	62015625	23625	2.285486874
62	11000	3	121000000	33000	2.324705499
63	11750	3	138062500	35250	2.082857311
64	7125	3	50765625	21375	2.416215624
65	13500	3	182250000	40500	2.082857311
66	7125	2	50765625	14250	1.952128561
67	4625	2	21390625	9250	3.037177186
68	25375	2	643890625	50750	1.945592124
69	4500	1	20250000	4500	2.082857311
70	7125	3	50765625	21375	2.043638686
71	6375	3	40640625	19125	2.082857311
72	7125	2	50765625	14250	2.207049624
73	9500	2	90250000	19000	2.416215624
74	13500	2	182250000	27000	3.122150874
75	27000	2	729000000	54000	1.79525406
76	1625	1	2640625	1625	2.25280468
77	10375	1	107640625	10375	2.416215624
78	13500	0	182250000	0	2.58616299
79	16750	4	280562500	67000	2.3377783
80	12000	3	144000000	36000	2.3704605
81	12625	4	159390625	50500	2.5992358
82	17000	3	289000000	51000	3.2005881
83	28500	3	812250000	85500	2.7168917
84	19250	3	370562500	57750	2.5861629
	16750	2	280562500	33500	2.5861629
				50250	

Sample No	Savings	Subscription	Savings ^ 2	Savings * Subscription	Y
88	7625	3	58140625	22875	2.109003061
89	16750	2	280562500	33500	2.586162999
90	18500	1	342250000	18500	2.677673124
91	10875	1	118265625	10875	2.278950436
92	10875	1	118265625	10875	2.278950436
93	24125	1	582015625	24125	2.971812811
94	33500	1	1122250000	33500	3.462045624
95	12375	0	153140625	0	2.357387686
96	57125	3	3263265625	171375	4.697432311
97	67000	4	4489000000	268000	5.213810874
98	47125	3	2220765625	141375	4.174517311
99	57875	3	3349515625	173625	4.736650936
100	57750	2	3335062500	115500	4.730114499
101	56375	2	3178140625	112750	4.658213686
102	72000	2	5184000000	144000	5.475268374
103	63500	2	4032250000	127000	5.030790624
104	41375	2	1711890625	82750	3.873841186
105	73500	1	5402250000	73500	5.553705624
106	60250	1	3630062500	60250	4.860843249
107	72750	1	5292562500	72750	5.514486999
	TOTAL	183	5.53E+10	2891250	

$$x = \text{Savings}$$

$$y = \text{Subscription}$$

$$a = \text{sum } y / 107$$

$$b = \text{sum } xy / \text{sum } x^2$$

$$a = 1.71028037$$

$$b = 5.2292\text{E-}05$$

$$y = a + bx$$

$$y = 1.71 + 0.0000522x$$

Table No - 2:

Regression Table

x = Savings

y = Subscription

$$r = \frac{\sum(x-\bar{x})(y-\bar{y})}{(\sum(x-\bar{x})^2 * \sum(y-\bar{y})^2)^{0.5}}$$

Sample No	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})^2$	$(y-\bar{y})^2$	$(x-\bar{x})(y-\bar{y})$
1	-12903.03738	1.289719626	166488373.6	1.663376714	-16641.30054
2	-11528.03738	1.289719626	132895645.8	1.663376714	-14867.93606
3	-9028.03738	1.289719626	81505458.93	1.663376714	-11643.63699
4	-10528.03738	1.289719626	110839571.1	1.663376714	-13578.21643
5	5971.96262	1.289719626	35664337.53	1.663376714	7702.157397
6	-12278.03738	0.289719626	150750201.9	0.083937462	-3557.188398
7	-11153.03738	0.289719626	124390242.8	0.083937462	-3231.253818
8	-10778.03738	0.289719626	116166089.8	0.083937462	-3122.608959
9	-14403.03738	0.289719626	207447485.8	0.083937462	-4172.842603
10	-14403.03738	0.289719626	207447485.8	0.083937462	-4172.842603
11	-14403.03738	0.289719626	207447485.8	0.083937462	-4172.842603
12	-9653.03738	0.289719626	93181130.66	0.083937462	-2796.674379
13	-8278.03738	0.289719626	68525902.86	0.083937462	-2398.309894
14	-13653.03738	-0.710280374	186405429.7	0.50449821	9697.484497
15	-13653.03738	-0.710280374	186405429.7	0.50449821	9697.484497
16	-11528.03738	-0.710280374	132895645.8	0.50449821	8188.138702
17	-11403.03738	1.289719626	130029261.5	1.663376714	-14706.7211
18	-12903.03738	0.289719626	166488373.6	0.083937462	-3738.263164
19	-10778.03738	0.289719626	116166089.8	0.083937462	-3122.608959
20	-13653.03738	0.289719626	186405429.7	0.083937462	-3955.552883
21	-4403.03738	0.289719626	19386738.17	0.083937462	-1275.646343
22	-16153.03738	-0.710280374	260920616.6	0.50449821	11473.18543
23	-12903.03738	-0.710280374	166488373.6	0.50449821	9164.774216
24	-11403.03738	-0.710280374	130029261.5	0.50449821	8099.353655
25	-12153.03738	-0.710280374	147696317.6	0.50449821	8632.063936
26	-15403.03738	0.289719626	237253560.5	0.083937462	-4462.562229
27	-13653.03738	0.289719626	186405429.7	0.083937462	-3955.552883
28	-9653.03738	0.289719626	93181130.66	0.083937462	-2796.674379
29	-9778.03738	0.289719626	95610015	0.083937462	-2832.889333
30	-13653.03738	-0.710280374	186405429.7	0.50449821	9697.484497
31	-15403.03738	-0.710280374	237253560.5	0.50449821	10940.47515
32	-15403.03738	-0.710280374	237253560.5	0.50449821	10940.47515
33	-12903.03738	-0.710280374	166488373.6	0.50449821	9164.774216
34	-12153.03738	-0.710280374	147696317.6	0.50449821	8632.063936
35	-11528.03738	-0.710280374	132895645.8	0.50449821	8188.138702
36	-12903.03738	-0.710280374	166488373.6	0.50449821	9164.774216
37	-1153.03738	-0.710280374	1329495.2	0.50449821	818.9798215
38	-13653.03738	-1.710280374	186405429.7	2.925058958	23350.52188
39	-13653.03738	-1.710280374	186405429.7	2.925058958	23350.52188

Sample No	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})^2$	$(y-\bar{y})^2$	$(x-\bar{x})(y-\bar{y})$
39	-13653.03738	-1.710280374	186405429.7	2.925058958	23350.52188
40	-12153.03738	-1.710280374	147696317.6	2.925058958	20785.10132
41	-12903.03738	-1.710280374	166488373.6	2.925058958	22067.8116
42	-12153.03738	-1.710280374	147696317.6	2.925058958	20785.10132
43	-11528.03738	-1.710280374	132895645.8	2.925058958	19716.17608
44	-13028.03738	-1.710280374	169729758	2.925058958	22281.59664
45	-18028.03738	-1.710280374	325010131.8	2.925058958	30832.99851
46	-11528.03738	-1.710280374	132895645.8	2.925058958	19716.17608
47	-11528.03738	-1.710280374	132895645.8	2.925058958	19716.17608
48	-11528.03738	-1.710280374	132895645.8	2.925058958	19716.17608
49	-8903.03738	-1.710280374	79264074.59	2.925058958	15226.6901
50	-10403.03738	-1.710280374	108223186.7	2.925058958	17792.11066
51	-9653.03738	-1.710280374	93181130.66	2.925058958	16509.40038
52	-10528.03738	-1.710280374	110839571.1	2.925058958	18005.89571
53	-10528.03738	-1.710280374	110839571.1	2.925058958	18005.89571
54	971.96262	-1.710280374	944711.3347	2.925058958	-1662.328593
55	-5403.03738	2.289719626	29192812.93	5.242815966	-12371.44073
56	-6153.03738	1.289719626	37859869	1.663376714	-7935.693068
57	7096.96262	1.289719626	50366878.43	1.663376714	9153.091976
58	1346.96262	1.289719626	1814308.3	1.663376714	1737.204127
59	221.96262	0.289719626	49267.40468	0.083937462	64.30692725
60	971.96262	1.289719626	944711.3347	1.663376714	1253.559267
61	-4653.03738	1.289719626	21650756.86	1.663376714	-6001.113629
62	-1528.03738	1.289719626	2334898.235	1.663376714	-1970.739798
63	-778.03738	1.289719626	605342.1647	1.663376714	-1003.450079
64	-5403.03738	1.289719626	29192812.93	1.663376714	-6968.403349
65	971.96262	1.289719626	944711.3347	1.663376714	1253.559267
66	-5403.03738	0.289719626	29192812.93	0.083937462	-1565.365969
67	-7903.03738	0.289719626	62457999.83	0.083937462	-2289.665034
68	12846.96262	0.289719626	165044448.6	0.083937462	3722.017206
69	-8028.03738	-0.710280374	64449384.17	0.50449821	5702.157393
70	-5403.03738	1.289719626	29192812.93	1.663376714	-6968.403349
71	-6153.03738	1.289719626	37859869	1.663376714	-7935.693068
72	-5403.03738	0.289719626	29192812.93	0.083937462	-1565.365969
73	-3028.03738	0.289719626	9169010.375	0.083937462	-877.2818572
74	971.96262	0.289719626	944711.3347	0.083937462	281.5966468
75	14471.96262	0.289719626	209437702.1	0.083937462	4192.811598
76	-10903.03738	-0.710280374	118876224.1	0.50449821	7744.213468
77	-2153.03738	-0.710280374	4635569.96	0.50449821	1529.260196
78	971.96262	-1.710280374	944711.3347	2.925058958	-1662.328593
79	4221.96262	2.289719626	17824968.36	5.242815966	9667.110671
80	-528.03738	1.289719626	278823.4747	1.663376714	-681.0201722
			2401.749677	5.242815966	222.017214

Sample No	$x-\bar{x}$	$y-\bar{y}$	$(x-\bar{x})^2$	$(y-\bar{y})^2$	$(x-\bar{x})(y-\bar{y})$
84	6721.96262	1.289719626	45184781.46	1.663376714	8669.447116
85	4221.96262	0.289719626	17824968.36	0.083937462	1223.185431
86	4221.96262	1.289719626	17824968.36	1.663376714	5445.148051
87	-153.03738	1.289719626	23420.43968	1.663376714	-197.3753125
88	-4903.03738	1.289719626	24039775.55	1.663376714	-6323.543536
89	4221.96262	0.289719626	17824968.36	0.083937462	1223.185431
90	5971.96262	-0.710280374	35664337.53	0.50449821	-4241.767843
91	-1653.03738	-0.710280374	2732532.58	0.50449821	1174.120009
92	-1653.03738	-0.710280374	2732532.58	0.50449821	1174.120009
93	11596.96262	-0.710280374	134489542	0.50449821	-8237.094947
94	20971.96262	-0.710280374	439823216.1	0.50449821	-14895.97345
95	-153.03738	-1.710280374	23420.43968	2.925058958	261.7368275
96	44596.96262	1.289719626	1988889075	1.663376714	57517.57795
97	54471.96262	2.289719626	2967194712	5.242815966	124725.5219
98	34596.96262	1.289719626	1196949823	1.663376714	44620.38169
99	45346.96262	1.289719626	2056347019	1.663376714	58484.86767
100	45221.96262	0.289719626	2045025903	0.083937462	13101.6901
101	43846.96262	0.289719626	1922556131	0.083937462	12703.32561
102	59471.96262	0.289719626	3536914338	0.083937462	17230.19477
103	50971.96262	0.289719626	2598140973	0.083937462	14767.57795
104	28846.96262	0.289719626	832147252.4	0.083937462	8357.531222
105	60971.96262	-0.710280374	3717580226	0.50449821	-43307.18841
106	47721.96262	-0.710280374	2277385716	0.50449821	-33895.97346
107	60221.96262	-0.710280374	3626684782	0.50449821	-42774.47813

$x = \text{Savings}$

$y = \text{Subscription}$

$$\text{sum}(x-\bar{x})^2 = 38497165888$$

$$\text{sum}(y-\bar{y})^2 = 140.0186916$$

$$\text{sum}(x-\bar{x})(y-\bar{y}) = 598619.1589$$

$$r = \text{sum}(x-\bar{x})(y-\bar{y}) / ((\text{sum}(x-\bar{x})^2 * \text{sum}(y-\bar{y})^2)^{0.5})$$

$$r = 0.257835804428584$$

Table No - 3:

Financial Discounting Technique and Present Value Table

Sample No	Total Income p.a (in Rs)	Disposable savings p.a (in RS)	Present Value (in Rs)
1	900000	441000	717066
2	900000	436500	709749
3	960000	432000	702432
4	900000	402000	653652
5	780000	381000	619506
6	750000	361500	587799
7	900000	347250	564628.5
8	750000	346500	563409
9	900000	342750	557311.5
10	900000	338250	549994.5
11	780000	282750	459751.5
12	780000	248250	403654.5
13	420000	201000	326826
14	360000	171000	278046
15	360000	162000	263412
16	360000	152250	247558.5
17	360000	144750	235363.5
18	300000	117750	191461.5
19	240000	115500	187803
20	240000	111000	180486
21	240000	111000	180486
22	240000	102000	165852
23	210000	100500	163413
24	210000	100500	163413
25	210000	100500	163413
26	210000	100500	163413
27	300000	83250	135364.5
28	180000	81000	131706
29	180000	81000	131706
30	180000	81000	131706
31	180000	81000	131706
32	180000	81000	131706
33	180000	76500	124389
34	240000	75750	123169.5
35	210000	74250	120730.5
36	210000	74250	120730.5
37	210000	72000	117072
38	150000	70500	114633
39	180000	68250	110974.5
40	150000	66000	107316

Sample No	Total Income p.a (in Rs)	Disposable savings p.a (in RS)	Present Value (in Rs)
			101218.5
43	180000	62250	92682
44	150000	57000	79267.5
45	180000	48750	76828.5
46	150000	47250	74389.5
47	240000	45750	69511.5
48	180000	42750	69511.5
49	180000	42750	69511.5
50	150000	42750	69511.5
51	150000	42750	69511.5
52	150000	42750	69511.5
53	150000	38250	62194.5
54	150000	38250	62194.5
55	150000	27750	45121.5
56	150000	27000	43902
57	60000	25500	41463
58	60000	21750	35365.5
59	60000	21000	34146
60	60000	17250	28048.5
61	60000	17250	28048.5
62	60000	17250	28048.5
63	60000	16500	26829
64	60000	12750	20731.5
65	60000	12000	19512
66	60000	12000	19512
67	60000	12000	19512
68	30000	10500	17073
69	30000	10500	17073
70	150000	9750	15853.5
71	60000	8250	13414.5
72	30000	6750	10975.5
73	30000	6750	10975.5
74	30000	6000	9756
75	30000	6000	9756
76	30000	6000	9756
77	30000	6000	9756
78	30000	6000	9756
79	30000	6000	9756
80	30000	6000	9756
81	30000	2250	3658.5
82	30000	2250	3658.5
83	30000	2250	3658.5
84	30000	2250	3658.5
85	60000	1500	2439
86	30000	-2250	0

Sample No	Total Income p.a (in Rs)	Disposable savings p.a (in RS)	Present Value (in Rs)
89	30000	-2250	0
90	60000	-2250	0
91	30000	-2250	0
92	30000	-3000	0
93	30000	-6750	0
94	30000	-6750	0
95	30000	-6750	0
96	30000	-6750	0
97	30000	-6750	0
98	30000	-6750	0
99	30000	-6750	0
100	30000	-6750	0
101	30000	-11250	0
102	30000	-11250	0
103	30000	-17250	0
104	30000	-17250	0
105	30000	-17250	0
106	30000	-21750	0
107	30000	-33000	0

Bibliography

KCT Business School
Department Of Management Studies

Survey on Personal Credit Rating

1. Name:

2. Age:

3. Qualification:

4. Occupation: Service Self employed

5. Marital Status: Single Married

 → Spouse employed Yes No

 → Number of children: 0 1 2 3 >3

 → Number of other dependents:

 → Number of children:

School going :

College going :

Employed :

6. Monthly Income:

< Rs.5000

Rs.5001 – Rs.10000

Rs.10001 – Rs.25000

Rs.25001-Rs.100001

> Rs.100001

7. Other Income:

< Rs.5000

Rs.5001 – Rs.10000

Rs.10001 – Rs.25000

Rs.25001 – Rs.100001

8. Ownership of assets

(i) Movable assets:

2 wheeler/ 4 wheeler

Fridge

Television

Washing Machine

(ii) Immovable assets:

Land: Yes No
 House: Rent Own
 If 'Own' Inherited Acquired

If 'Acquired', Housing loan Availed
 Not Availed

If 'No' do you have any plans to acquire housing loan

Yes No

9. Do you own a life insurance policy Yes No

10. Do you subscribe to mediclaim insurance Yes No

11. Do you invest in share market Yes No

12. Do you invest in chit fund Yes No

13. Do you invest in recurring deposit Yes No

14. Do you own Credit card Yes No

Debit card Yes No

→ If you own it, you use it for Purchase

Travel

→ If you don't own, do you like to own.

Credit card Yes No

Debit card Yes No

15. Shopping preference – do you wish to purchase

Branded Products

Discount sale products

Department stores or local grocery shops nearby

16. Have you gone on family tour within one year Yes No

If yes indicate the place.....

17. If loan is given to you which would you prefer to buy

Two wheeler

Four wheeler

Other consumer durables specify.....

18. In case of need do you extend a temporary bridge loan to your friend/near

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