# International Multidisciplinary Research Journal

# Golden Research Thoughts

# "EXPLORATIONS OF VARIOUS STATISTICAL TECHNIQUES IN MARKETING"

**N.Udaya Prakash[1] , S. Balaji[2] and Mohana Priya[3]**
[1]Lecturer, Great Lakes Institute of Management, Chennai.
[2]Research Scholar, AMET University , Lecturer, Great Lakes Institute of Management, Chennai.
[3]Research Scholar, AMET University.

## ABSTRACT

*P*urpose - The purpose of the research is to explore the various statistical techniques in marketing. Multivariate Analysis & Marketing -. Multivariate analysis is an analysis of statistical technique that analyse the relationship between more than two variables which shows the effect of more than one variable on one variable that is independent variable. Multivariate analysis helps the organization in decision making for the future.

Research Methods / Design /Approach - The main objective of the study is to know how multivariate techniques are applied in marketing. 2) To analyze the credit card usage patterns of Indian consumers with special reference to Ahmedabad city. 3) To identify the characteristics of interest rate, types of credit cards that consumers like, extent of using credit card in a week, knowledge of different brands available in the market, particular reason of using the particular banks. Sample size comprises of 500 respondents.

Findings - Majority of the people think that the bank is the safest place for investment and nowadays use of plastic money is increasing rapidly since most of the respondents spend by swapping a card rather than paying cash. In this era people want to use plastic money they think that this is a safer to carry than hard cash.

Originality / Value – This research study aims at analyzing the consumer preference, attitudes and behavior towards credit cards in Indian market using various statistical methods including multivariate techniques..

Paper – Research Paper

**N.Udaya Prakash**

**KEYWORDS:** *Multivariate Analysis, Credit Cards, Banks etc*

## INTRODUCTION :
### Multivariate Analysis
      Multivariate analysis is an analysis of statistical technique that analyse the relationship between more than two variables which shows the effect of more than one variable on one variable that is independent variable. Multivariate analysis helps the organisation in decision making for the future. Applied multivariate analysis refers to the application of multivariate statistical techniques to the problems of market researches; analysts and business researchers use multivariate techniques for analysing the data. Multivariate analytical techniques are applicable in the field of industries, Government sector, Universities and Research centres. Multivariate techniques makes possible to conduct theoretically significant research and to evaluate the effects naturally occurring parametric variation in the manner in which usually they occur. The main benefit of multivariate techniques is to analyse the market scenario which explain what customer's habit, preferences, choices, target market campaigns, new product or serving Design and Refinement existing product

### Basic Concepts of Multivariate Analysis:
      The Variate: A variate is a building block of multivariate analysis. It is a linear combination of variables with empirically determined weights. The variables are specified by the researcher, whereas the weights are determined by the multivariate technique relevant to a specific objective. A variate of n weighted variables (X1 to Xn) can be defined mathematically as

Variate value = $_{w1}X_1 + _{w2}X_2 + \ldots + _{wn}X_n$

1

Where $X_n$ is the observed variable and wn is the weight which is determined by the multivariate technique.

**Measurement scales:** Measurement scale is a technique to measure the variable or to identify the data in selection of the appropriate multivariate method of analysis. Data can be classified into generally two categories.

### 1.Non Metric Measurement Scales
a) Nominal Scales:
b) Ordinal Scales
Metric measure Scales:
a)Interval Scales:
 b) Ratio Scales
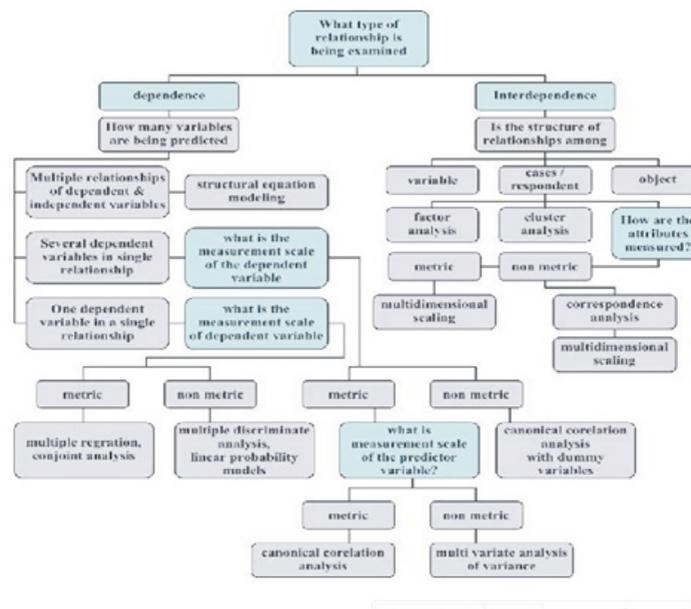
**MULTIVARIATE APPLICATIONS TO CREDIT CARD MARKET:**

Applications of variable Techniques in apply are accelerated in modern world owing to the arrival of high speed electronic computers. Multivariate Techniques are for the most part empirical and agitate the reality; they possess the power to research complicated information. Consequently in most of the applied and activity researches, we have a tendency to usually resort to Multivariate Techniques for realistic results. Multivariate Techniques is beneficial in higher cognitive process. Multivariate techniques have widescope of applications within the field of credit card to require the assorted selections like product differentiation, customers segmentation, development, distinctive the market share, competitors' market share etc.

**2. BRIEF REVIEW OF LITERATURE:**

**Eric Rosenberg; Alan Gleit (1994)** have worked in decision making in the area of consumer and commercial credit. The decisions of interest include whether to extend credit, how much credit to extend, when collections on delinquent accounts should be initiated, and what action should be taken. They surveyed the use of discriminant analysis, decision trees, and expert systems for static decisions, and dynamic programming, linear programming, and markov chains for dynamic decision models. Since these models do not operate in a vacuum, they discussed some important aspects of credit management in practice, e.g. legal considerations, sources of data, and statistical validation of the methodology. They provided perspective on the state-of-art in theory and in practice.

•**D. J. Hand and W. E. Henley (1997)** have reviewed statistical classification methods in consumer credit scoring. Credit scoring was used to describe a formal statistical methods used for classifying applicants for credit in to 'good' and 'bad' risk classes such methods have become increasingly important with the dynamic growth in consumer credit in recent years. Standard statistical methods used in the industry for developing score-cards

81

are discriminant analysis, linear regression, logistic regression and decision trees.

•**Jinkook Lee and Jeanne M. Hogarth (1999)** had worked on consumer credit card shopping decisions. In credit card market with wider price dispersion, greater anticipated savings and lowered search cost, consumer's search activities are expected to payoff in terms of finding a credit card with lower Annual Percentage Rate (APR). The purpose of this paper was to explore whether consumers who revolve shop for credit and the relationship between search and the payoff to search as measured by APR of the major credit card customer holds. They collected information by personal interview and dual sampling method. They have used APR method and Ordinary Least Squares (OLS) method for this research. Customer educators and policy makers can take heart that there is evidence that customers are shopping for credit and this shopping results in customers obtaining lower APR on their credit cards.

•**Lucia F. Dunn and Tae Hyung Kim (1999)** had investigated consumer credit card usage and default with a new monthly set of survey. Credit card holder default is examined in an ordered probit analysis where the number of missed minimum payment in the last six months is fitted to key financial aspect of credit card use and a variety of socio economics variables. The three explanatory financial variables are (I) the total minimum required payment to income ratio (II) the percentage of total credit line which the consumer has used (III) the number of credit cards on which the consumer has charged to the credit limit. These variables were found to have a significant positive effect on the probability of credit card default, whereas the variables most commonly used to predict default- the total credit card debt to income ratio was not statistically significant.

•**L.C. Koo, Fredrick K.C. Tao & John H. C Yeung (1999)** have used Conjoint analysis which is ultimately a research for restaurant visitors. It analyze the visitor that how and on what base he chooses the restaurant. This relies on several purposes like whether it is family or business lunch or dinner or if it is with friends or colleagues. It can also depend upon the type of restaurants or their cuisines. The research indicates the core purpose of the restaurant visitor along with their minor needs. This method uses the

82

customers themselves for sources of customer information. Some restaurants fail in snatching their customers and they are not aware with the need of their customers and no records for their past experience are the reason

of their failure. Among many data, a researcher has to choose required information and should take care that he doesn't miss any important data for research. Apart from that to have thorough ideas and to meet accuracy for the research there would be large size of the sample. Synthesis in the research can also be taken in order to interact with dynamic research.

•**Satish Chandra & Dennis Menezes (2001)** this paper provided a brief look at the growth of international tourism and the marketing role of the National Tourism Organization. The objective of this paper was to identify the most relevant multivariate analysis techniques to address the key marketing strategy planning task of NTOs. They focused on forecasting demands, segmentation, target market selection and positioning. It concluded that the large number of NTOs involved in international tourism. Also referring to the significant differences in the size and operating budgets of these NTOs, the marketing roles and tasks performed by these organizations were likely to vary significantly.

•**Marti j. Anderson (2001)** has described a new non parametric method for multivariate analysis of variance. According to their study several applications in ecology, to provide an alternative and perhaps more intuitive formulation for ANOVA. The test statistic is multivariate analogue to fisher's F-ratio and is calculated directly from any symmetric distance or dissimilarity matrix

•**Sara Dolnicar (2003)** had showed that there was a wide variety of techniques available for grouping individuals into market segments on the basis of multivariate survey information, clustering remains the most popular and most widely applied method. A review of the application of such data driven partitioning techniques revealed that questionable standards have emerged. This study aimed at revealing typical patterns of data driven segmentation studies, providing the critical analysis of emerged standards and suggesting improvement. The study demonstrated that the existence of both common misconceptions underlying and routine procedures for conducting market segmentation studies: (I) Cluster analysis was typically conducted by

83

computing single groupings, partitioning algorithms were applied repeatedly in only 5% of the studies under investigation. This indicates that the explorative nature of cluster analysis was not typically accounted for (II) Segments were usually revealed or constructed using cluster analysis in a black-box manner. This was supported by the observation that most of the parameters of the partitioning algorithm applied were not critically questioned. Instead, pre-prepared algorithms were imposed on the available data, even if they were inappropriate for the data at hand. To improve the quality of empirical data-driven market segmentation studies these points should be considered (I) thorough understanding of the procedures (II) careful harmonization of algorithms and the data at hand (III) transparent reporting on studies conducted.

•**Mitchell H. Katz (2003)** had worked on Multivariable models of mathematics which are believed as a black box by many clinical readers. On the other hand there isn't significant of mathematics in such models. With the help of thorough information of multivariable analysis, readers can decide to whether to throw how much weight on the analyses report. Deep knowledge of the concept which stipulates multi variable analysis may help readers in choosing better weigh up target.

## 3. RESEARCH METHODOLOGY
### Research Problem:

Every entity needs to do a lot of market research taking in mind the growing cut throat competition that is coming up with new products or services. They also need to understand the psychology, attitudes and preferences for market development, market segmentation, market penetration, diversification etc. For doing market research not only qualitative but also quantitative data and their appropriate classification, analysis, interpretation and measurement is required. For all these statistical techniques like univariate, bivariate and multivariate are useful in analysis and in managerial decision making. So they need a help of all these technique in taking marketing decision. The multivariate techniques like cluster analysis,. factor analysis, multidimensional scaling are widely used in marketing

The core problem of the research study is to analyze the credit card market in India using various dimensions of credit card market such as interest rate, types of cards, knowledge of different banks who are

issuing credit cards etc.

## OBJECTIVES OF THE STUDY:
• The main objective of the study is to know how multivariate techniques are applied in marketing.
• To analyze the credit card usage patterns of Indian consumers with special reference to Ahmedabad city.

## RESEARCH DESIGN:
Research design is the blue print for empirical research work that guides the researcher in a scientific way towards the achievement of the objectives.

The major characteristics of credit card users have been identified by using Descriptive Research Design. The major factors affecting demand for credit cards and their usage pattern have been identified by using Causal Research Design.

## SAMPLING DESIGN AND DATA COLLECTION:
The data is related to the study of credit card market and the selected field of study is Banking Sector. Sample size comprises of 500 respondents, which was computed as under:
Sample size determination n = z2eσ2 2

## 6. LIMITATIONS AND FURTHER SCOPE FOR RESEARCH
This research study is based on small sample size collected from only Ahmedabad city. Sample is completely selected by convenience method. Sample size consists of only 500 respondents. The study is based on limited data set. We wanted to have some information from the bank credit card agents, but was not available easily. The study covers individual card holders only. Corporate card holders have been excluded from this study. Credit card holders and non-holders who do not have bank account are not included in this study.

## 7. SUMMARY, SUGGESTIONS AND CONCLUSION
### Suggestions:
Based on the findings of the study the following suggestions are made here:
✦ To popularize the credit cards different mass media channel like television, radio, railway centers and super markets with a pictorial review of the card facility should be applied.
✦ To create awareness about interest free credit period to the non-holders of credit cards.
✦ By direct marketing benefits of credit cards can be explained to the consumers.
✦ In credit cards incentives are attracting feature. So, incentives should be extended to all types of cards to promote greater usage of credit cards.
✦ By providing more facilitating services consumers can be attracted to use the credit cards.
✦ To provide knowledge about supporting services to the consumers.
179
✦ Interest rate is the main factor to choose a credit card. So, reduce the interest rate to attract the consumers.

The research was undertaken to know the use of different multivariate techniques in the field of marketing. The study is designed through the use of questionnaire to conduct the credit card survey to evaluate the consumer's preferences, their purchase behavior and usage patterns of credit cards. The study considered various aspects like types of credit cards that consumers like, extent of using credit card in a week, knowledge of different brands available in the market, particular reason of using the particular bank's credit card, their satisfaction level with the credit card, whether their purchase decision vary according to the various level of interest rate, enhancements and service offered by the banks.

This research study aims at analyzing the consumer preference, attitudes and behavior towards credit cards in Indian market using various statistical methods including multivariate techniques. These methods are useful to the management to take crucial marketing decision in the field of credit cards.. This study reveals that

Credit card market is still in its primitive stage in India and there is a lot of scope of improvement in India. Even amongst the credit card holders, their perception about the use of credit cards as a safe and convenient mode of monetary transactions needs to be enhanced. People still use the credit cards with reluctant mind set and they are not aware about the full use of the benefits of credit cards. More awareness about the use of credit cards must be created by the banks by introducing various promotional schemes which might be attractive to the people and they must be assured about the security

**REFERENCES:**
**BOOK REFERENCE:**
1.Philip Kotler and Kevin Lane, Marketing Management, PHI Learning Pearson Education, 13th Edition, 2008.
2. Jay D. Lindquist and Joseph Sirgy, Shopper, Buyer and Consumer Behavior, Biztranza, 2008.
3. C.R. Kothari, Research Methodology, Tata Mc Graw-Hill Publishing Company Ltd., 13th Edition, 1982.
4. Deepak Chawla and Neena Sondhi, Research Methodology, Vikas Publishing House PVT Ltd., 2011.
**JOURNALS:**
1.Academic journal of management, July 1998
2.Consumer Preference Patterns in Apparel Retailing in India, proceedings of the fourth ASIA PACIFIC retail conference, 4th-6th September 2007
3. Journal of Marketing & Communication, September - December 2009 Vol. 5 Issue 2
4.African Journal of Business Management Vol. 4(10), pp. 1990-2005, 18 August, 2010
5.ASBM, Journal of Management,  Vol. III, No. 1&2, 2010
6.Vol. 5(31), pp.12319-12324, 7 December, 2011
7.Global Journal of Management and Business Research Volume XII Issue II Version I © 2012 Global Journals Inc. (US) 2012 February
8.African Journal of Business Management Vol. 6(11), pp. 4196-4207, 21 March, 2012, Available online at http://www.academicjournals.org/AJBM    DOI: .5897/AJBM11.2460    ISSN 1993-8233 ©2012 Academic Journals

**WEBSITES:**
1.HTTP://www.allprojectreports.com/Project Report on Retail Marketing in India
2.HTTP://www.asbbs.org/files/2011/JBBS_23.3_Fall_2011.pdf#page=66
3.HTTP://www.sbs.ox.ac.uk/CENTRES/OXIRM/Documents/ProceedingsAPRetailConference2007.pdf#page=22 3
4.HTTP://www.academicjournals.org/ajbm/pdf/pdf2012/21Mar/Jhamb%20and%20Kiran.pdf
5.HTTP://edissertations.nottingham.ac.uk/1007/1/Kanika_Dissertation.pdf

**S. Balaji**
**Research Scholar, AMET University , Lecturer,  Great Lakes Institute of Management, Chennai.**

# Publish Research Article
# International Level Multidisciplinary Research Journal
# For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper,Summary of Research Project,Theses,Books and Book Review for publication,you will be pleased to know that our journals are

## Associated and Indexed,India

* International Scientific Journal Consortium
* OPEN J-GATE

## Associated and Indexed,USA

* EBSCO
* Index Copernicus
* Publication Index
* Academic Journal Database
* Contemporary Research Index
* Academic Paper Databse
* Digital Journals Database
* Current Index to Scholarly Journals
* Elite Scientific Journal Archive
* Directory Of Academic Resources
* Scholar Journal Index
* Recent Science Index
* Scientific Resources Database
* Directory Of Research Journal Indexing