CHAPTER 4
RESEARCH METHODOLOGY

4.1 INTRODUCTION

Research is synonymous to its very name, re-search or search again. It intends to either study the effect of a particular scheme or a product on a population, or the practice of a new theory or revision of an existing one, or the response to a change, market conditions, cause effect relationships and so on. This is done through a systematic way of investigation right from the identification of the problem to interpretation of results, enabled with statistics. In this chapter, the researcher goes into the research design and methodology to realize the objectives under study.

The study was conducted for finding out different factors and variables that influence a customer to select a bank for him to bank with and also to find out what are the various variables influence him for continuing his banking relations with his present bank. The customers are defined are niche customers in line with major banks differentiation of customers based on transactional and financial values of balance maintained with them. In this specific study, retail customers with a bank business balance of Rupees one lakh and above are considered niche customers. The study was conducted among 385 customers of banks in the specified area. The study also researches whether any mitigating factors for the customers to alter or shift the continuance intentions.
4.2 OBJECTIVES

A research objective is a statement which directs the researcher to study the variables, which could be either to study the relationships, or the differences, or even cause effect relationships. They are what the researcher seeks to achieve at the end of the study. It summarizes and quantifies the plans of the study. The objectives guide the researcher in the process. The caption itself is another form of the objective. Studying about the determinants influencing the bank selection is the aim or the general objective. The actual objectives mentioned are the specific objectives. It gives the researcher specific instructions as what actually to study in identifying the key determinants influencing continuing intentions and how could the society benefit from the findings.

The objectives form the basis of any research study and the researcher needs to build the further process of research on the objectives of the study. In this study the research was directed attaining the objectives through forming related hypotheses and testing. It is concise and clear statement, which is giving direction while investigating the variables related. It is the statement as what are the achievable for the researcher while concluding the study. It needs to be realistic as achievable in the time frame set for the research. A orderly and structured objectives formulation will help the researcher to collect data, identify the sample, and analyze in a scientific manner.
Research Design

Research design is the blueprint for conduct of the research to be undertaken, with detailed procedures necessary to obtain information needed for structuring or solving the research problem. The research design is formulated after the broad approach is developed. It helps to conduct the research efficiently and effectively. The research design usually involves the following:

a) Definition of information necessary for research
b) Designing of the exploratory, causal or descriptive phases.
c) Definition of scaling and measurement procedures
d) Construction of questionnaire for collecting the data
e) Define the process of sampling and size of sample
f) Formulate data analysis plan

Classification of Research Design

Research design can be broadly classified as exploratory and conclusive. Exploratory method is used to define a problem more precisely and to provide insight into a problem. The needed information is defined in a loose manner and the adopted process is unstructured and flexible. The sample may be non-representative as it is usually small and the information is qualitative nature. With these kinds of findings this type of research is considered as tentative and may needs further research.

Exploratory Research

Objective : For insight and understanding of the research problem
Characteristics : Qualitative data is obtained primarily, using a flexible and unstructured process.
Findings : Tentative
Outcome : Usually Needs to be followed up with conclusive research
The objective of the research is to explore or search through a problem or situation to provide insights and understanding. It could be used in any of the following purposes

1. Formulate a problem or define a problem
2. Identify alternative courses of actions
3. Develop hypotheses
4. Isolate key variables
5. Gain insight for developing an approach
6. Establish priorities for further research

Conclusive research can be used to verify the insights given by the exploratory research. Conclusive research is more formal and structured in nature. This research is based on large and representative samples and data can be analyzed using quantitative methods.

Objective : For setting hypotheses and examining relations
Characteristics : Needed information is clearly defined, with structured and formal process. Data is analyzed using quantitative methods.
Findings : They are conclusive in nature
Outcome : Usually the inputs are used for decision making

Conclusive research can be classified as Descriptive research or causal research

**Descriptive research**

This type of research is conducted for the following reasons:

1. For describing the characteristics of concerned groups, such as customers and organizations.
2. For estimating the proportion of units in a population which exhibit a certain behavior
3. For determining the perceptions about characteristics of product
4. For determining the degree to which different variables are related
5. For making predications specifically. For example, how the banking consumers will behave if the price of a product is steeply increased.

The descriptive research has a clear problem statement and hypotheses clearly defined.

**Causal research**

Causal research is used for obtaining evidence of causes for effects in a relationship. When decisions are made on continuous assumptions, such decisions may not be relied on justifiable causes. In order to establish the relationship scientifically we use causal research in formal research projects. This type of research usually has the undermentioned purposes

a) For understand the cause variables and the effect variables
b) For determining the relationship nature among the causal variables and the predicted effect.

As, descriptive research, causal research process also needs a structured and planned approach.

**Relationship: Exploratory, Causal and Descriptive Researches**

The research project can be involved in many types of research designs to service more than one purpose. The combination of research designs to be employed depends on problem nature. The following guidelines can be referred in such situations

1. When there is not much information on the situation, exploratory research is desirable to begin with. Exploratory research is appropriate when we need the problem to be defined precisely, research questions formulated and other courses of actions formed. Alternative courses of action identified.
2. The initial step in the research design framework is Exploratory research. Generally, this needs to be followed up by descriptive or causal research projects.

3. Every research design need not be begun with exploratory research. The selection of research design depends on the problem definition and precision of the same.

4. Exploratory research helps the managers to understand the findings and provide insights.
4.3. QUANTITATIVE & QUALITATIVE RESEARCH

There are two distinct schemes of research techniques, namely quantitative and qualitative research. Quantitative methods emphasize objectivity of data collected through likewise designed questionnaire. Quantitative Research as termed by the very name is used to quantify the responses by using numerical data which can be tabulated and processed statistically. It collects numerical data for processing and analyzing for the purpose of generalizing results to prove or reject a hypothesis. It can quantify qualitative variables as attitudes or opinions, along with measurable or quantifiable data to make generalizations from a population. Through this method, measurable data leads to formulation of facts and . Quantitative data collection methods are much more structured than Qualitative data collection methods. Quantitative data collection methods include forms of surveys: online as well as through

4.3.1. Salient features of Quantitative research:

- The data is collected using structured questionnaire
- The purposes or objectives are laid down as specific questions to be responded on scales
- Data values are numerical to facilitate coding, tabulation and analysis on the basis of scores
- The study is done in comparatively larger samples
- The study is useful in wider generalization of concepts and for cause-effect studies

Despite advantages, Quantitative research is not free from disadvantages. The objective and numerical data could contain a considerable amount of data with less quality. It could be

- Data numerically collected need to be explained literally
- Quantitative techniques can only consider what is tangible, some qualitative variables like attitude cannot be easily considered
• As Quantitative techniques are based on assumptions, it could lead to incorrect conclusions, lest adequate care is taken in formulating the scale based question

• There are wide chances for insufficient data like missing values, patterned responses, outliers

• The researcher has less control over the attitudes and biases of the respondents which could alter actual responses, unlike as in a personal interview

Quality check of data is a must for assumption of normality, randomness, data independence and reliability. So prior to data analysis, the data needs to pass through the following steps

1. Verification of missing values
2. Identification of Outliers
3. Analysis of Normality
4. Validity and Reliability
5. Verifying various assumptions behind proposed analyses

Qualitative research is different from quantitative as the former deals with subjective or quality data. It studies more qualitative variables as skills, attitudes, behavior patterns, opinions and so on. It provides information to be developed for quantitative research as well
4.3.2. Salient features of Qualitative Research

Qualitative data collection methods include unstructured or semi-structured tools like interview, group discussions, observation and even participation

- The sample size is comparatively smaller, so representative quality might be less, when compared to quantitative
- Qualitative research is more intensive than extensive
- Qualitative research is meant to understand or explore the problem to study motives and effects in depth

Qualitative research is preferred to know the
- Meaning attributed to a happening by the target group
- Context and its influence on the responses
- Process and sequence of events coloring the responses
- Causal explanations

Qualitative research also has the additional advantage of an extra mile of information unforeseen to be sought by the researcher, obtained through interaction with the target group.

The method of research employed in the study is Quantitative. It collects data on large scale, through surveys with questionnaires or structured interviews. It differs from Qualitative methods which deals with lesser target group, with greater depth, involving more time. Qualitative responses are subjective, but Quantitative objective and statistically valid.

This research is based on quantitative methods. The sample size assessment is based on statistical formulas in relation to the population. Sample sizes yielding findings with minimum 95% confidence interval are preferred in empirical studies. Quantitative techniques facilitate scale validation and theoretical model estimation.
4.4. RESEARCH PROCESS

The research process was divided into two levels

**Level I** includes identification of the problem to arrive at objectives, literature review, preliminary study for finalizing the variables for developing the theory. Framing the objectives was the real task faced by the researcher. Without clear cut objectives, the scholar would not know what to do, when and how. The objectives or aims actually help the researcher fix his aim to proceed in the research. Literature review gave insights into previous and related studies. This enabled the researcher to frame the hypothesis to be subject to proving in the research.

**Level II** encompassed with design of sampling, design of questionnaire, strategies for collection of data for analysis. This was the actual research to practice, if in the first level, the researcher conducted theoretical study. Level II was a continuation of level I. A suitable sample from a population was selected, structured questionnaire on a multiple choice response pattern based on likert scale was developed. The questions were drafted as statements to which the respondents marked their preferences. The collected data was analyzed using statistical tools after quality check and selection of quality data adhering to the sample size.

The researcher identified the problem specifically from a broad subject- the problem formulation. The next step was review of literature in depth to have clarity on the subject. This functioned as torch bearer to the researcher and gave him clarity on the subject, on related study and identified the gap in knowledge which he needed to fill through research. It was identified that there existed a gap in knowledge about the factors influencing continuous intentions in business relationships on the part of bank customers, in India. Then was conducted the preliminary study. The objectives were identified. This led to the formulation of the theoretical framework and identified the variables for study. The relationship between the variables and objective were
understood. Following this the independent, dependent and moderating variables were classified from among the variables selected according to the needs of the study.

The researcher prepared the sampling design and decided on the methods of data collection. The Questionnaire was designed to meet the requirements of study and inclusive of the variables under consideration, in such methods which would quantitatively study the relationship between the objectives and variables. The questionnaire was based on the variables and guided by the review of literature. Percentage analysis, descriptive tests (mean and standard deviation), as well as other applicable statistical tools were used for analysis like SPSS 20 and AMOS 20.
Figure 3: Research Process
The research process involved three stages, namely

- Exploratory stage
- Descriptive stage
- Analysis stage

In the exploratory stage the researcher studied the nature of data pertinent to the research, the problem with greater precision, aided by review of literature and the inter-relationships of the variables for theory development. A strong base for the research is set in the Exploratory stage. The descriptive stage finalized the design, including scale design, questionnaire design, sample design and design of methods for data collection. The analysis went through the tabulation, processing and testing of data for quality, reliability, factor study and confirmation of multi dimension structure and hypothesis testing.

**4.4.1 Exploratory research**

This type of study is synonymous to its name, meaning ‘to explore’. It provides the base of the study. Literature review helped throw light on the subject through books, related studies, contemporary reports and journals, to be followed by a preliminary study by interaction as an informal interview, as a qualitative approach, with a few niche retail bank customers. This gave conceptual and construct clarity and strengthened development of theory.

**4.4.2 Descriptive research**

This followed the exploratory stage, which provide the researcher with some insight into the subject for the next course. It involved the research design. Survey was opted by this study for better generalizations of results. Cross sectional studies of the population was considered appropriate for better verification of variables and relationships from different samples at the same period. The further steps involved were questionnaire design, scale development, sampling design and data collection.
4.4.2.1 Questionnaire and Scale

The Questionnaire is a research instrument and a tool of data collection. It is a set of questions meant for survey or statistical study. The questionnaire facilitates data collection from a large target group. Design of appropriate questionnaire is of much relevance in the process of survey and of statistical significance in the analysis and interpretation of data and generalizations of findings. Questionnaires should adhere to standards capable of evoking responses crucial to the study and capable for processing. Incorrect questions, with inappropriate response patterns can adversely affect the intention of study, by not accurately reflecting the participant responses and misrepresenting statistical analysis to end up with incorrect findings. Pilot study is a good means for check on a questionnaire and to ensure its capability in accurately capturing the intended information on a subset of the sample.

Questionnaires can be structured, semi structured or unstructured, depending upon the requirement of the researcher. Closed or Structured Questionnaires is quantitative method of research, suggested by Emile Durkheim. This questionnaire requires lesser levels of involvement by the researcher with more number of respondents. A semi-structured questionnaire is a mix of unstructured and structured questionnaires. Some of the questions and the sequence of queries are predetermined, while some others evolve in the unfolding of the survey. An unstructured questionnaire serves the purpose of guide to an interviewer amidst survey in a study or research. Anyhow there is flexibility in the type of questions and the sequence of it being asked, are is not used in a predetermined method.

Questionnaires are of many types, based on the pattern of responding, they are as: responses are of either yes or no type, some questionnaires are open ended where the respondent can give his opinions, another kind of questionnaires are of multiple choice model, in which the responses are
marked from alternatives, it could also be in the order of preferences to a stimulus or variable

The standardized responses are the raw data, which are later processed and analysed to arrive at findings proposed in the hypothesis and guided by the objectives. The questionnaire is an invention of the Statistical Society of London. This shows the relevance of questionnaire in statistics and analysis. This study has used mostly of closed ended questions in the questionnaire, with 68 questions and the target group had to mark the responses on a five point Likert scale. The demographic variables were asked in addition. However, the identity of the respondents was not enquired. The responses pattern was as,

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The benefits of this scale are:

- Higher reliability coefficients with lesser items
- Extensive use in marketing research
- High likelihood of responses
- Increased spread of variances

A self-administered questionnaire would be developed based on the following twenty six independent variables to measure respondents opinion on

- Bank’s proximity to home and/or work place.
- Facilities provided for easy parking
- Branch ambience
- Any branch banking
- Automatic alert for transactions.
- Uninterrupted ATM (Automated Teller Machine)
- CDM (Cash DepositMachine) service all times
- Connectivity to other bank’s ATMs
- Hassle free and secured Internet banking
Phone banking facility
Mobile apps and wallets
Reliable website
Safety and security of funds
Low/reasonable service charges
Higher interest rates for deposits / or lower interest rates for loan
Secrecy of transactions
Personal attention
Waiting time made minimum.
Good complaint handling
Good mannered and friendly staff
Attire of employees
Availability of single point contact
Staff attitude towards agents of the customer.
Bank’s size and strength
Advertisement
Age of the bank
Dependability of the bank for other products such as loans, insurance products.
Transparency in dealings
Reasons for multiple banking.

Descriptive variables of the target group was studied; age, education, bank business balance, length of association with the bank and type of bank. Studying group comparisons in assessing their considerations on the various attributes influencing the determinants for bank selection with continuance intention was yet another objective of the study. The niche retail customers were differentiated as of

- PSB and Private Banks
- 18 to 25 years, 25 to 40 years, >40 years
- Undergraduates, Graduates, Post Graduates/Professionals
- Association of <3 years, 3 to 5 years, 5 to 8 years, > 8 years
- Business of 1 to 10 lakhs, 10 to 20 lakhs, 20 to 30 lakhs, >30lakhs
Questions were short and in statement model to which the respondent had to mark the level of importance he attached as part of his decision in having a continuous intentions of business. No negative statements were made to avoid confusions and misrepresent customer inputs. The questionnaire was segmented according to the variables and was inclusive of all the variables under study.

A Pilot study was conducted on 40 respondents, that is niche retail bank customers, from both Public sector banks and private banks. This helped the scholar to fine tune the questionnaire to a more reliable and precise draft. The researcher had interviewed many of the respondents in the pilot study. After this the questionnaire was slightly altered; some ambiguous and seemingly irrelevant questions, total of 7, were avoided and some were rephrased.
4.4.2.2 Sample Design

The sampling design refers to the definite plan to obtain a sample from the population. Niche retail bank customers are the population which is almost infinite and the sample is restricted to Ernakulam district city limits, reducing the population to a finite sample. The sample includes any number of units to represent the population. The stages in sampling design involve determining the

- Sample unit
- Sample size
- Sampling technique

The sample unit is a subset of the sample. A niche retail bank customer is the sample unit. Sample size is relevant in generating adequate data. Of a total of 565 respondents, a final list of 385 was selected as the sample after rejection due to missing values, outliers and subsequent approximation. The ideal sample size is 385 for a given population. (National Statistical Service, Australia). Simple random sampling technique was employed to collect data with structured, closed end questionnaire. The samples were collected at random from bank branches and also online, without bias or prejudice and being non-judgmental about respondents and responses.
4.4.2.3 Data Collection

Data collection is one of the most important parts of research process. The information culled out from the data needs to be presented in a manner such that decision makers can understand very easily. As such, accuracy and reliability need to be maintained. Also, the data source is to be taken care seriously.

Survey

Survey refers to the sampling of individual units from a population, to enable data collection from the target group, as part of research. Tools and techniques for survey are questionnaire, interview, case study, observation, even participant observation, or a combination of two or more of these, as required by the study. This research required data collection was through primary and secondary methods. Primary data include survey of respondents through questionnaire and secondary methods include supplementary data.

Sources of Data Collection

There are primary or secondary sources for obtaining data. Primary data refer to information obtained. The firsthand information obtained by the researcher by the researcher on the interested variables for the purpose of the study is known as primary data. Information gathered from already existing sources is known as secondary data. Examples of primary data sources are focus groups, individuals, panels set up by the researcher etc. Secondary sources for data collection are many. Company records or achieves, industry analyses, publications by government, websites, internet, and so on.

Primary Data Collection

The survey was conducted in person by email or/and by post or in person. The respondents were approached with requests for e-based survey or in hard form.
The data will be stored in the survey hosting website, retrievable only by the researcher or collected by the researcher by person. All data would be collected anonymously and no identification will be collected from participants in the questionnaire. The data was also collected personally by the scholar from the customers in the premises of the bank branches. The purpose of study was explained to them and questionnaires were given to those who were willing to respond. The questionnaire was an appropriate method of survey in collecting personal data and responses. Personal data short of identity of the respondents facilitated cross sectional analysis, which means studying different groups of people at a particular time. This was different from longitudinal analysis which studied single group of respondents over different periods of time. The respondents marked their responses on the five level Likert scale, from “Not important” to “Most important” responses. Follow up was done to collect the filled in questionnaires. This survey was conducted during the months of December (2016), January and February this year (2017)

**Methods of Collecting Primary Data**

An integral part of research design is data collection. Out of the several methods for data collection, choosing the appropriate one for the concerned study has a vital role in the outcome of the study.

There are various ways in which data can be collected. Data collection methods include different types of interviews such as: Face to face interviews, computer assisted interviews, telephonic interviews, and interviews via electronic media. Questionnaires can be either sent through the mail, personally administered or electronically monitored.

Administering questionnaires, Interviewing and observation of phenomena and people are the three main methods of data collection in survey research. Motivational techniques and Projective tests are sometimes used to tap different variables. In projective method, respondents are required to write a story, complete a sentence, or offer their reactions to cues such as unlabeled
pictures or inkblots. The assumption is that the respondents project their own feelings, thoughts, expectations and attitudes which can be interpreted by trained professionals.

Interview method has the advantage that the researcher can have flexibility in terms of, adopting, adapting and amending the questions in proceeding with the interviews. Questionnaires have advantage of obtaining data in an efficient manner with regard to time, cost and energy of the researcher. Non-obtrusive data collection methods such as extraction from company records etc. have the advantage of more accuracy. For example, attendance records, may give a truer and more reliable picture of the absenteeism of employees than information directly provided by the respondents. In the case, projective tests, they are administered by researchers who are trained to interpret the results. Projective techniques are predominantly done in Market research.

Technology has played an important role in the development of research Surveys assisted by Computers help both parties of interviewing –for preparing and administering questionnaire electronically and answering instantly and the transmitting the same for processing.

The data collection methods choices are depending on the level of accuracy required, facilities at hand for the researcher, the researcher’s expertise, the duration of the study and resources and cost related to the gathering of data

Secondary data was collected from many sources. Contemporary writings, journals, news, media, previous research in related fields, websites of banks, Government and RBI and so on. Secondary data included from the banking industry on business figures, trends, customer demographics and patterns and over the years,. Literature on bank policies and comparative customer trends and or business trends were additional and enriched data
4.4.3. Data analysis

The collected data need to be tabulated to process in order to arrive at conclusions. First of all the quality of the data need to be checked, for further action, namely tabulation and analysis. Quality check is done as

1. Verification of missing values
2. Identification of Outliers
3. Analysis of Normality
4. Validity and Reliability
5. Verifying various assumptions behind proposed analyses

The data was intended to be collected from 565 customers by means of questionnaire, which got reduced to 475 owing to no responses from 90 numbers. These responses were entered into SPSS 20 in different variable names for quality check. 59 responses were found as either incomplete or missing responses or patterned responses. They were rejected and the remaining 416 responses were selected. 27 responses were further eliminated as outliers.

Outliers refer to data where the scores are of extreme values, different from others. They are formed due to various reasons as biased responses from the target group, data entry errors, sampling errors and the like. Identifying outliers is one of the most step prior to processing of data, as it can drastically effect the analysis and findings. Statistics has different methods to detect outliers. A univariate outlier has an extreme score on a single variable and is verified using Z scores which is the difference between the outlier and the mean divided by the Standard Deviation (SD). Z scores are transformed observations of variables where the mean that equals 0 and standard deviation 1

\[ Z = \frac{\text{Mean} - \text{Value}}{\text{SD}} \]
Hair et al (1998) suggested Z scores could range from 3 to 4. Here Z scores above absolute 4 were treated as outliers and removed.

A multivariate outlier has extreme scores on two or more variables. (Kline 2005 and Markus 2012) A common method of identification of multivariate outliers is D2 or computation of squared Mahalanobis distance, for each case. A multivariate outlier would have a D2 value far apart from other D2 values. As none of the leverage values were above 0.5, absence of multivariate outliers is established. 27 responses were identified as outliers based upon Z scores and rejected from the collected data, which brought down the sample size to 389. Out of this 385 responses were studied as a sample size of 385 quality data is adequate to validate, test and analyse., with confidence level 95% and confidence interval 0.05, standard error 0.02551 and relative standard error 5.10.

Many statistical methods assume that the variables observed are normally distributed. In multivariate statistics, it is assumed that the combination of variables follows a multivariate normal distribution. There is no direct test for multivariate normality, each variable is tested individually. The absence of normality hampers with goodness of fit and standard errors. (Baumgartner and Homburg 1996)

Analysis for univariate normality was done with Kolomogrov-Smirnov test. It was inferred that non-normality existed. To find out the extent of non-normality check for skewness and kurtosis was conducted.

Skeweness refers to the symmetry of a distribution, or more precisely the lack of symmetry. Kurtosis refers to the peakedness of a distribution. A distribution is considered normal when values of skeweness and kurtosis are equal to zero. Absolute values of univariate skewedness indices greater than 3.0 seem to describe extremely skewed data sets and kurtosis greater than 10.0 may suggest a problem (Chou and Bentler 1995). In this study none of the values are above these values and hence univariate normality can be generally assumed.
Testing the reliability of data is the prerequisite for data analysis and interpretation. In statistical analysis, unidimensionality should be first assumed, before checking validity and reliability (Hair et al 1995). This reduces the possible misspecifications (Gerbing & Anderson), as the analysis of validity and reliability is based on the assumption of unidimensionality. Netemeyer et al (2003) opines that dimensionality of a measure is concerned with the homogeneity of items and is defined as the number of common factors needed to account for the correlation among items.

Validity determines whether the scale truly measures what it was meant to measure. Reliability analysis tests whether a scale consistently reflects the subset it measures. (Churchill, Nunnally & Bernstein). Values between 0.7 and 0.8 of Cronbach’s alpha are acceptable values of consistency (Field 2005). In analysis of reliability, reverse scored items make a difference and in extreme situations they can even lead to negative Cronbach’s alpha. Testing the reliability of data is the prerequisite for data analysis and interpretation. In statistical analysis, uni-dimensionality should be first assumed, before checking validity and reliability (Hair et al 1995). This reduces the possible misspecifications (Gerbing & Anderson), as the analysis of validity and reliability is based on the assumption of uni-dimensionality.

Validity determines whether the scale truly measures what it was meant to measure. Analysis tests for reliability checks if a scale is able to reflect consistently the subset it measures. (Churchill et.al). By Consistency it is meant that a respondent’s score a questionnaire at different times alike Likewise, two respondents with the same attitude should identically score the survey. Values between 0.7 and 0.8 of Cronbach’s alpha are acceptable values of consistency (Field 2005). In analysis of reliability, reverse scored items make a difference and in extreme situations they can even lead to negative Cronbach’s alpha. This criterion is used to test the reliability of reflective constructs. The approach to test reliability of formative and reflective constructs are different. As formative constructs are composed of different aspects of a construct, their indicators are not necessary to correlate with each other. “It is not clear that reliability is a concept that applies well to formative constructs.” (Diamantopoulos and
Winklhofer 2001, Diamantopoulos & Siguaw 2006, Rossiter 2002). This leads to conclude that no reliability tests are mandatory for formative constructs. Reliability evaluation for formative constructs is to ascertain the absence of multicollinearity. Multicollinearity is tested using Variance Inflation Factor (VIF). Theoretically, VIF should be less than 3.3 (Diamantopoulos 1999 and 2006, with others and VIF less than 10 explains the absence of Collinearity (Hair et al 1998).

The aim of the validity is like double check. That is, checking if those elements have measured what they had to measure (Bryman, 2008). The varieties of validity are

- Face or content validity
- Convergent validity
- Discriminant validity
- Nomological validity

The researcher has adopted SPSS 20 for EFA and AMOS 20 for CFA in scale validation for measurement for multi-dimensional variables and PLS 5.0 for SEM to evaluate the research models

The aim of the validity is like double check. That is, checking if those elements have measured what they had to measure (Bryman, 2008). The analysis was done in a four stage process following quality check through

- Exploratory Factor Analysis
- Confirmatory Factor Analysis
- Structural Equation Modeling
- One-way Anova
The first stage was to identify five distinct factors of service excellence construct through an exploratory factor analysis of 20 indicators used for measurement. The factor structure from EFA confirmed adequate loading for each factor with minimum chance for cross loading. The second stage developed measurement models for the service excellence construct by confirmatory factor analysis and the test of goodness of fit of data samples into the measurement model. The CFA confirmed service excellence construct as a multidimensional second order formative construct with five first order reflective constructs. The third stage with structural equation modelling SEM, studied the effect of the unidimensional variables on service excellence construct, which influenced continuance intentions on the part of the customers. This was studied with two models. The first model without the effect of moderation by Pricing and the second model with the effect of moderation by Pricing. The fourth stage involved group comparisons among respondents using Levene’s test of Equal variances, One way ANOVA, ‘t’-test and Multiple comparisons using Turkey HSD and findings to be summarized.
4.5. STATISTICAL DESIGN

Descriptive Statistics

The salient features of quantitative data is referred to as Descriptive Statistics. The aim of descriptive statistics is to summarize data sets and tabulate them for ready reference, analysis or comparisons. Descriptive statistics differs from inferential or inductive statistics in that, the latter supports statements inferred about a population or sample. Descriptive statistics is generally presented along with more formal analysis. On the contrary, inductive statistics is used in data analysis to arrive at conclusions. The level of significance is relevant in research, while making group comparisons. This significance level is often represented as a p-value.

Descriptive analysis is applied to measure the mean and Standard Deviation between the variables under study with Age, Bank Business Balance, educational qualifications and length of association with the bank.

Mean

Arithmetic Mean (AM) is the sum of the values of the items divided by the number of items, or just an average. It is the most common measure of Central tendency, along with Median and Mode. It is abbreviated as AM and the symbol is X bar. \( \sum X \) denotes the sum of all numbers. The symbol used to denote the sum or the total of the values is \( \Sigma \), name of symbol sigma. \( N \) refers to the number of items. Mean values were used for analysis in most of the tabulated data in the study. The information by the mean is relevant in in relatively symmetric data or data with normal or near normal distribution, It could mislead inferences in skewed data sets.

\[
\mu = \frac{\sum X}{N} \quad \text{Sample Mean} \\
\bar{X} = \frac{\sum x}{n}
\]
Standard Deviation

There is a permissible level of deviation for values of an observation from the mean. In Statistics, Standard Deviation is a quantity expressing by how much the members of a group differ from the mean value for the group. It quantifies the variation or dispersion in a set of data. When the deviation is low, the data are near mean values and data values spread in a wider range from the mean denotes high Standard Deviation or variance. Standard Deviation is abbreviated as SD and represented by ‘S’ or the Greek letter sigma $\sigma$. SD is taken from actual mean and is the square root of the variance

$$S = \sqrt{\frac{\sum(X - \bar{X})^2}{N}}$$

where $S$ = the standard deviation of a sample,
$\sum$ = the sum of,
$X$ = each value in the data set,
$\bar{X}$ = mean of all values in the data set,
$N$ = number of values in the data set.

Frequency Distribution

A summarized grouping of data divided into mutually exclusive classes and the frequency or the number of occurrences in a class is shown in a frequency distribution. Histograms, bar diagrams, tables and pie charts are graphs usually expressing frequency distribution. Frequency distribution is an organized tabulation of the number of individuals located in each category on the scale of measurement. Salient features of a Frequency distribution are

- A set of categories that make up the original measurement scale.
- A record of the frequency, or number in each category.

The frequency distribution of the variables is calculated using the formula

$$FD = \frac{F}{N} \times 100.$$ 

The number of respondents is expressed as $F$ and $N$, the sample
The frequency distribution of the variables helped the researcher to calculate the value of distribution of the variables tested. This are used in quantitative as well as in qualitative data too. Quantifying the demographic profile of the respondents in the study was enabled mainly by frequency distribution

**Weighted Arithmetic Mean**

Instead of calculating the simple mean to obtain a realistic average, weighted mean is used. This is variety of the mean, when some data values are given more weightage than the others to calculate the mean. If all the weights are equal, then the weighted mean equals the arithmetic mean

**t- Test**

The significant statistical relationship between two group means, or Equality of means is studied using t-Test

**ANOVA**

Analysis of variance is a collection of statistical models used to analyze the differences among group means and their variations among and between three or more groups. It analyses the variances of a response. In this study the variance in responses towards continuance intentions with bank selection owing to Age, length of association with the bank, educational qualifications and bank business balances are analyzed. One way ANOVA is used in group comparisons.

**Durbin- Watson test** studies the existence of an autocorrelation in a study. This statistics should be between 1.5 to 2.5. In the present study, value of 2.039 confirms Independence of Observations

**Runs test** was applied for assumption of randomness. p values should be above 0.05 to assume randomness of data. Here the p values were in general above 0.05 and randomness of data was assumed
Kolomogrov-Smirnov test

This was for the analysis for univariate normality. Many statistical methods assume that the variables observed are normally distributed. In multivariate statistics, individual normality of variables ensures normality in multivariate distribution. It was inferred that non-normality existed. To find out the extent of non-normality check for skewness and kurtosis was conducted.

Skewness and Kurtosis

Skewness is a measure of symmetry. It can be further clarified as this measures the lack of symmetry. Kurtosis measure the data’s are peakedness Absolute values of univariate skewedness indices greater than 3.0 seem to describe extremely skewed data sets and kurtosis greater than 10.0 may suggest a problem (Chou and Bentler 1995). In this study none of the values are above these values and hence univariate normality can be generally assumed.

Levene’s test was used to confirm equal variances in the population and for group comparisons. It tests the assumption that variances of population from different samples are equal, which is a null hypothesis. The assumption of homogeneity is tested by performing Levene’s test of homogeneity. As the p value was greater than 0.05, it is concluded that both groups have approximately equal population variances. While hypothesis test is conducted if the p value is less than 0.05, we can conclude that there is a significant difference in the respondents’ perceptions. And in case p value is greater than 0.05, we can conclude that no significant difference in respondents perceptions based on the considered attributes.

Tukey HSD was used to study multiple comparisons among groups in comparisons of cross sections of the target group. It is also known as Tukey’s range test or Tukey’s HSD honest significance test. This is a one step multiple comparison test in statistics.
Group comparisons were undertaken by One way ANOVA with Tukey HSD post hoc analysis for precise statistical information.

**Exploratory Factor Analysis using SPSS 20**

This is factor structure study. EFA explores and exposes the relationship among the variables in dimensional factorisation.

This chapter discussed the various methods employed to carry forward the study. It explains the sequence and logic of actions, while unfolding the actual research process: the preliminary part of problem formulation and literature review, design of questionnaire, sampling, data collection and analysis. It gives an account of the statistical design for data processing and analyzing. This procedure helps in finalizing theory by employing appropriate measurement models and proposal of rationale backed analysis strategies.