RESEARCH METHODOLOGY

The design of any research project requires considerable understanding of the research methods and the data analysis. Research design is the conceptual structure within which research is conducted\(^1\). Therefore, a research design provides the framework for the collection and analysis of data. This chapter deals with the research methodology, in which, the methods used to achieve the objectives of the study have been described. It gives the detailed description of the hypotheses developed, population, sample selection and size, the research instruments used to collect data and the tools used to analyse the data.

3.1 Hypotheses of the Study

In order to achieve the objectives stated in first chapter, the following null hypotheses have been developed:

- **H\(_0\)1**: there is no significant association between the location and awareness level of customers with respect to banking services.

- **H\(_0\)2**: there is no significant association between educational background and awareness level of customers of rural bank branches;

- **H\(_0\)3**: there is no significant association between educational background and awareness level of customers of urban bank branches;

- **H\(_0\)4**: there is no significant association between educational background and awareness level of rural and urban bank customers together.

- **H\(_0\)5**: there is no significant difference between the opinion of rural and urban bank customers regarding importance of sources of awareness with respect to banking services.

\(^1\) http://www.ihmctan.edu/PDF/notes/Research_Methodology.pdf
\( H_06: \) there is no significant difference between rural and urban bank customers as regard to their bank selection criteria.

\( H_07: \) there is no significant difference between the ratings given by rural and urban bank customers on Deposit services.

\( H_08: \) there is no significant difference between the ratings given by rural and urban bank customers on Fee based services.

\( H_09: \) there is no significant difference between the ratings given by rural and urban bank customers on E-banking services.

\( H_010: \) there is no significant difference between the responses of rural and urban bank customers regarding the problems associated with E-banking services.

\( H_011: \) service quality factors do not have any significant impact on customers’ overall satisfaction with respect to banking services.

\( H_012: \) there is no significant difference between rural and urban bank customers on account of their satisfaction level with regard to service quality factors.

\( H_013: \) there is no significant difference in customer satisfaction regarding banking services across their demographic characteristics.

3.2 Sampling and Sample Design

A procedure or plan, drawn up before any data are collected, to obtain a sample from a given population is called sample design. The sample design provides information on the target and final sample sizes, and the sample selection methodology. Therefore in this section, a description of the universe of the study, its population and sample selection has been presented.
3.2.1 Universe of the Study

The universe of the study is comprised of the depositors of rural and urban bank branches who are having any kind of deposit account with any scheduled commercial bank in Punjab.

3.2.2 Population of the Study

The study has been conducted in three districts of Punjab i.e. Jalandhar, Ludhiana and Amritsar. These districts have been selected on the basis of amount of deposits with the scheduled banks in each district and the above mentioned districts are occupying the first three positions in the deposit mobilisation (SLBC, September, 2007). All the persons having any kind of deposit account with the selected banks in these three districts constitute the population of the study.

3.2.3 Selection of Banks

The Indian banking industry is categorized into non-scheduled banks and scheduled banks. Scheduled banks constitute commercial banks and co-operative banks. The present research work is restricted to scheduled commercial banks only and five banks have been selected for the study on the basis of maximum number of bank branches located in the rural areas of Punjab and these are as follows:

1) Punjab National Bank (PNB),
2) Punjab & Sind Bank (PSB),
3) State Bank of Patiala (SBP),
4) State Bank of India (SBI) and

These banks are holding first five positions in Punjab on the basis of maximum number of branches located in rural areas (State Level Bankers’ Committee, March, 2007). To enable the compatibility among rural and urban customers, only public sector banks have been considered for the study as the branches of private sector and foreign banks are rarely found in rural areas of Punjab.

3.2.4 Sampling Technique and Sample Size

Sampling is a part of statistical practice concerned with the selection of individual elements intended to yield some knowledge about population of concern for the purpose
of statistical inference (Chawla, 2007). Sampling suggests that the people chosen are a sample of a population and the purpose of their selection is to enable findings to be applied to a population and it implies that they are the representatives of the population (Polkinghorne, 2005). It is a very difficult task to study each and every element of the population and therefore, a representative number of elements have to be drawn from the total population which is referred as a sample. For drawing sample from the population, first of all, the districts have been selected on the basis of amount of deposits in the banks in each district and thereafter, the banks have been chosen on the basis of maximum number of bank branches located in rural areas. As the study has been planned to carry out a comparison of customer satisfaction of rural and urban branches, for collecting responses from the customers, the researcher personally visited the bank branches. Multi Stage Sampling technique has been used for data collection. At first stage, the bank branches have been selected following random sampling technique i.e. from each selected district, four branches of each selected bank (two from rural and two from urban) have been selected at random. In the second step, customers have been selected from the selected branches following convenience sampling.

3.3 Banking Services Selected for the Study

As discussed earlier, the study is restricted to the depositors only and therefore, the customer evaluation of banking services has been analysed only for the selected personal banking services which are available to an individual depositor of both rural and urban branches. The banking services selected for the present study have been grouped under following three categories:

1) Deposit Services
   (i) Savings A/c,
   (ii) Fixed Deposit A/c,
   (iii) Recurring Deposit A/c,
   (iv) Current A/c and
   (v) NRI Deposit A/c.

2) Fee based Services
   (i) Issuing Drafts,
(ii) Safety Lockers,
(iii) Collection of Cheques/ Drafts/ Bills,
(iv) Issuing Travellers’ Cheques,
(v) Payment of Bills on behalf of Customer,
(vi) Foreign Money Change and Transfer, and
(vii) Sale and Purchase of Securities.

3) E-banking Services
(i) ATMs,
(ii) Debit Cards,
(iii) Credit Cards,
(iv) Internet Banking,
(v) Phone/Tele Banking and
(vi) EFTs (Electronic Fund Transfers)

The awareness level of the customers has been analyzed on the selected personal banking services including loan services. While examining the awareness level of the customers, the services of insurance and mutual funds have also been considered. Although these two services are offered to individual depositor yet these have not been considered to analyse customer evaluation of different categories of personal banking services because these are not provided by all selected banks at their own. Most of the selected banks are providing these services on behalf of insurance companies. Moreover, it was observed by the researcher during pilot survey that insurance and mutual funds were not used by the respondents. Therefore, these were excluded from the questionnaire for final survey. Because the goal of qualitative research is enriching the understanding of an experience, it needs to select fertile exemplars of the experience for study (Polkinghorne, 2005). Therefore, the services which have been actually experienced by the majority of the customers during pilot survey have been chosen for the study for comparatively analyzing the service evaluation made by rural and urban bank customers.

3.4 Data Collection

Data, as we all know, are the qualitative or quantitative attributes of a variable or set of variables and data collection is the planning for and obtaining useful information on key quality characteristics of the construct from the sampled respondents. Data collection
enables a researcher to formulate and test working assumptions about a process, and develop information that will lead to the improvement of the key quality characteristics of the product or service. In this section, the methods and procedure of conducting data collection have been discussed. Commensurate with the objectives of the study, the relevant data have been collected using secondary as well as primary sources.

3.4.1 Secondary Sources

Secondary sources of the information provide us the information which has been already gathered by someone else and is readily available from other sources. In the present research work, the secondary sources of information have been used to prepare a list of various personal banking services introduced by the selected banks which is a requirement for the achievement of one of the objectives of the study. This information has been gathered by visiting the websites of the respective banks, their published brochures and other reports. A list of various personal banking services was prepared which has been further used to trace out the gaps, if any, in the geographical coverage of the services provided by selected banks in the districts under study. The secondary sources have also been used to get the inputs for developing the questionnaire to conduct the survey of the study. The various secondary sources which have been used to carry out the present research work include journals, books, and various publications of RBI, Indian Banks’ Association (IBA), State Level Bankers’ Committee (SLBC) and National Institute of Bank Management (NIBM).

3.4.2 Primary Sources

The data which is originally collected by the researcher herself/himself for the study in hand is termed as primary data. There are a number of methods to collect the primary data but the questionnaire is a popular way of gathering information and is easy to understand as all respondents are presented with the same questions. It can save time as a researcher can collect information from quite a number of respondents at one time. Moreover, the questionnaires are used to gain a high response rate. Besides, the questionnaire offers advantages in terms of costs, speed, sample size, time and communication (Oppenheim, 2001). In the present study, two sets of
questionnaires have been used. A well structured questionnaire/schedule has been used to collect responses from customers and another structured questionnaire has been used to collect data from the bankers. The questionnaires involved are the self-administered questionnaires in which the researcher involved in the fieldwork. The questionnaire/schedule for the customers was designed in such a way so as it can gather all the information from the customers regarding their awareness with respect to banking services, preferences for bank, evaluation of traditional as well as E-banking services and their satisfaction level regarding banking services as well as their delivery process. A pilot survey of the study was conducted comprising of 25 respondents (including teachers and research scholars) from Amritsar and Jalandhar. The questionnaire was finalized by making necessary modifications as per input obtained through pre-testing. After finalisation, the questionnaire/schedule was administered to the respondents for final survey.

3.4.3 The Research Instrument

In the present study, two sets of questionnaires have been used and their details are as follows:

3.4.3a Questionnaire for Bank Officials

It includes a list of personal/retail banking services which was prepared by visiting the websites of the respective banks, their published brochures and other reports. The study is restricted to the personal banking services which are available to an individual depositor. Therefore, a list of 80 personal banking services was prepared which was grouped into seven categories namely; Deposit Services, Loan Services, Insurance and Mutual Funds, Agricultural Banking Services, NRI Banking Services, E-banking Services, and Other Services and Schemes. The list of the various services has been given in the annexure at the end of the thesis. The bank officials were asked to provide the information as regard to whether the service was available in rural and urban bank branches in the districts under study. For collecting the data, two columns (first urban and second rural) for each service were provided and the bank officer was asked to tick the column(s) if the service was available in those areas.
3.4.3b Questionnaire for Customers

The questionnaire/schedule for the customers was comprised of 15 questions besides the demographic profile of the respondents. The first four questions were of multiple choice in which the first question is related to the bank in which the customer was holding his/her bank account and the rest of the three questions were asked on the personal banking habits of the customers such as type of bank account, tenure of its holding and frequency of visiting the bank branch. The fifth question was concerned with the bank selection criteria of the respondents. In this question, the respondents were given a list of 14 variables (based on the review of literature) to measure their bank selection criteria and were asked to rate those on 5 point Likert scale ranging from 5 to 1, 5 for ‘Very Important’ and 1 for ‘Not Important’. The sixth question of the questionnaire/schedule was relating to the purpose of opening account with a particular bank(s) and was a multiple response question. The respondents were given six different purposes and were asked to tick before the purpose relevant to them.

One of the objectives of the study was related to the customer awareness with regard to banking services. Therefore, seventh and eighth questions of the schedule were asked on the customers’ awareness level and sources of awareness respectively. For this purpose, a list of 30 services (adapted and modified list given by Arora, 2005) grouped in six categories was provided to the customers and they were asked whether they were aware of or not with the particular service. If they were aware of particular service, they were asked to mark tick (†) before that service and if not, then to mark (×). As far as, eighth question was concerned, the customers were provided eight sources of awareness and were asked to rate the sources from which they get information regarding banking services and it was measured on a 5 point scale (Likert Scale) ranging from 5 to 1, where 5 was for ‘Very Important’ and 1 for ‘Not Important’. The study was basically planned to measure the customer satisfaction with respect to banking services. Therefore, questions 9th, 10th and 11th were concerned with the perception of customers with respect to Deposit Services, Fee based Services and E-banking Services respectively. In these questions, the customers were given a list of services in each of the three categories (mentioned in section 3.3 of this chapter) and were asked to rate these services on 5 point Likert scale ranging from 5 to 1, where 5 indicated that the service was ‘Excellent’ in customers’
opinion and 1 indicated that it was ‘Very Poor’. Due to lesser awareness of technology among consumers and technology failure issues, consumers often face various problems with respect to E-banking. Therefore, 12th question of the questionnaire/schedule dealt with the problems experienced by customers while using E-banking services. The customers were asked to rate eight problems on 3 point scale, where 3 indicated that the problem was never faced, 2 occasionally faced and 1 indicated that the problem was often faced by them. Most of the selected problems were concerned with the usage of ATMs and Debit Cards. Besides, the customers were also asked about the problems associated with internet accessibility, fund transfers and internet security. The customers were asked to rate the problems only if they had actually experienced these.

Question 13th was designed to measure the customers’ satisfaction level regarding the quality in delivery of the services by banks. It tried to cover every aspect of service quality in banks i.e. bank personnel, their behaviour, physical facilities, cost, return, time in service delivery and customers’ convenience. Therefore, a list of the 32 variables of service quality was prepared, most of which were primarily based and adapted from the items found by prominent scholars in the service quality in general (Parsuraman et al., 1985) and specifically covering the quality aspects in banking services (Galloway and Blanchard, 1996; Joseph et al, 1999; Lassar et al, 2000; Jamal and Nasser, 2002; Arora, 2005 etc.). The respondents were asked to rate these 32 items of service quality in banks on 5 point Likert scale ranging from 5 to 1 where, 5 was for ‘Highly Satisfied’ and 1 for ‘Highly Dissatisified’. Question 14th was asked on the overall satisfaction level of the customers with the services provided by their bank branch and it was also measured on 5 point scale. Last question was concerned with the suggestion(s), if any which the respondents wanted to give to improve customer service in banks. The demographic profile of the respondents was asked in the last part of the questionnaire/schedule.

The survey was conducted during August, 2009 to January, 2010.

3.4.4 Profile of the Sample

The study comprises of two samples; sample of bank officials and sample of customers.
3.4.4a Bank Officials’ Sample

In order to analyse the gaps in geographical coverage of banking services, a list of 80 personal banking services was presented to the bank officials (at branch level) to get the information as regards the availability of the service in rural and urban bank branches. The bank officials’ questionnaire was distributed to the officers of district level main branches of 5 selected banks. All the 5 responses were usable which represent a response rate of 100 percent.

3.4.4b Profile of the Customers’ Sample

Customers’ sample is comprised of two groups; one group constitutes the customers from rural bank branches and the other comprises of the customers from urban bank branches. An equal number of customers have been chosen from each selected district. A total of 600 questionnaires were distributed to target customers in three selected districts, out of which 539 responses were obtained; of which 516 were usable i.e. 255 from rural bank branches and 261 customers from urban bank branches. For effective and easy comparative statistical analysis, the number of questionnaires from urban group was reduced to 255 to have an equal number of questionnaires from rural and urban bank branches. The questionnaires were reduced from urban group by following random numbers given in Malhotra, 2008.

<table>
<thead>
<tr>
<th>District</th>
<th>Location</th>
<th>Number of Rural Respondents</th>
<th>Number of Urban Respondents</th>
<th>Total Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jalandhar</td>
<td></td>
<td>89</td>
<td>89</td>
<td>178</td>
</tr>
<tr>
<td>Ludhiana</td>
<td></td>
<td>87</td>
<td>86</td>
<td>173</td>
</tr>
<tr>
<td>Amritsar</td>
<td></td>
<td>79</td>
<td>80</td>
<td>159</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>255</td>
<td>255</td>
<td>510</td>
</tr>
</tbody>
</table>
The district wise distribution of the respondents has been shown in Table 3.1 which shows that the highest number of the respondents belong to the district Jalandhar followed by Ludhiana and Amritsar.

Table 3.2

Bank-wise Distribution of Respondents

<table>
<thead>
<tr>
<th>Bank</th>
<th>Location</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Percentage</td>
<td>Urban</td>
</tr>
<tr>
<td>PNB</td>
<td>65</td>
<td>25.49</td>
<td>65</td>
</tr>
<tr>
<td>SBI</td>
<td>56</td>
<td>21.96</td>
<td>58</td>
</tr>
<tr>
<td>PSB</td>
<td>45</td>
<td>17.65</td>
<td>53</td>
</tr>
<tr>
<td>OBC</td>
<td>52</td>
<td>20.39</td>
<td>42</td>
</tr>
<tr>
<td>SBP</td>
<td>37</td>
<td>14.51</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>255</td>
<td>100.00</td>
<td>255</td>
</tr>
</tbody>
</table>

Table 3.2 presents the bank-wise distribution of respondents. Table shows that the maximum number of respondents (25.49%) is from PNB as this bank is a lead bank in northern India and having maximum number of rural branches in Punjab followed by the SBI (22.35%) and PSB (19.22%). The customers from OBC and SBP form 18.43% and 14.51% respectively of the total responses.

3.5 Analysis of Data

Analysis of the data is a process by which data is converted into useful information as raw data collected from the questionnaire cannot be used without processing it in some way to make it amenable to draw conclusions (Nargundkar, 2010). It is a process of evaluating data using analytical and logical reasoning to examine each component in the data. Data from various sources is gathered, entered into any statistical package and then analyzed to form some sort of finding or conclusion and hence, data analysis is just one of the many steps that must be completed when conducting a research experiment. Therefore, before starting the data analysis, data has to be ready and once the analysis is complete, there is a need to put results into a format that users (customers, banks,
researchers, academicians, policy makers etc) can understand and use that information. There are a number of statistical packages available to analyse the data and get meaningful results. In order to carry out the analysis, SPSS (Statistical Package for Social Sciences) version 17 has been used. A brief description of the statistical techniques used in the present study has been presented in this section of the chapter.

3.5.1 Reliability Analysis

The reliability of the scale variables measures the extent to which the individual items or set of items yield the output consistent with the overall items in the scale. Reliability is the measure of internal consistency of the construct items which depicts the degree to which the items indicate the common latent construct (Chawla, 2007). Internal consistency signifies that the individual items or indicators of the scale should all be measuring the same construct and thus, be highly intercorrelated (Nunally 1979, Churchill, 1979). The Cronbach’ alpha is the most widely used measure to assess the consistency of the entire scale (Cronbach, 1951). The construct of customer satisfaction requires instruments so as to accurately measure that construct. Cronbach’s coefficient alpha estimates the reliability of this type of scale by determining the internal consistency of the test or the average correlation of items within the test. The generally agreed upon lower limit for Cronbach’s coefficient alpha should be .70 although it may decrease to .60 in exploratory research (Robinson et al., 1991 in Hair et al., 2008). The value of Cronbach’s Alpha varies from 0 to 1 but a satisfactory value is required to be more than .60 for a reliable scale (Malhotra, 2008). In the present research work, Cronbach’s alpha has been computed to check the reliability of two constructs i.e. ‘customers’ bank selection criteria’ and ‘service quality scale’. Reliability and Item Analysis have been used to construct reliable measurement scales and various measures of scale reliability such as corrected item-to-total correlation and Cronbach’s alpha have been computed that provide the information about the relationships between individual items in the scale. The values of Cronbach’s Alpha for the final scales of the two constructs have been arrived at .612 and .945 respectively. Therefore, a satisfactory alpha value has been found for the construct ‘customers’ bank selection criteria’ and relatively higher value of Cronbach’s alpha has been arrived for the construct ‘service quality scale’. The scales of these constructs have been used for further analysis in the study.
Figure 3.1: A Depiction of Statistical Techniques Used to Achieve the Objectives of the Study
3.5.2 Pearson’s Chi-square Test of Association

Pearson Chi-square test is used to test the statistical significance of the observed association in a cross-tabulation (Malhotra, 2008). The test is used to test the null hypothesis that there is no association between the variables. The Chi-square test has been used in the present research work by keeping in mind the second objective which has been framed to comparatively analyse the awareness level of rural and urban customers with respect to banking services. To get the responses from the customers, the data have been collected in the form of ‘Yes’ or ‘No’ on 30 selected personal banking services. Therefore, the nominally scaled data have been collected having two categories. This is the reason why this technique has been chosen for the analysis and performed to find out the association, if any, between two categorical variables. For this, first of all, the data have been cross tabulated and then Chi-square test has been applied to check whether the location of bank branch makes any difference in customers’ awareness level. This technique has also been used to check the association between customers’ awareness level and their education level. For analysis, first of all, the ordinal data on education level that had been collected in five categories have been clubbed and converted into two categories i.e. under graduates, and graduates or above. Thereby, nominally scaled data for two variables have been obtained and then the data have been cross tabulated to run Chi-square. The technique has been employed on frequencies but for easy understandability, percentages have also been shown in the analysis.

3.5.3 Independent Samples T- test

The Independent Samples T- test is commonly used to compare the mean scores of two groups on given variable(s) and to test the null hypothesis that the means of the two groups are not significantly different. In order to perform the T- test for independent samples, one independent (grouping) variable and at least one dependent variable are required where the dependent has been measured on interval scale. Two samples are said to be independent of each other if the measurement of one sample has no effect on the values of the other (Malhotra, 2008). Independent Samples T- test has been employed in the present study to check whether there is any difference between the opinion of rural and urban customers regarding the importance of sources of
awareness with respect to banking services. For this, the location has been taken as grouping variable and customers’ importance ratings on the sources of awareness as dependent variables. This technique has also been used to comparatively analyse the ratings given by rural and urban customers on different categories of banking services i.e. Deposit Services, Fee based Services and E-banking Services together with the problems associated with E-banking Services. For this, customers’ service ratings for different categories of services have been taken as dependent variables and location as grouping variable.

3.5.4 One-way ANOVA

One-way ANOVA is a statistical technique used to compare means of two or more samples using the F statistic. It is used to test the null hypothesis that two or more population means are equal. In One-way ANOVA, the dependent variable is the variable on which the groups are compared and it is always a metric variable and the independent variable is the categorical variable being used to define the groups. One-way ANOVA has been used in this study to compare the bank selection criteria of rural and urban bank customers and also to investigate the differences, if any, in satisfaction level of the customers on account of their demographic characteristics.

3.5.5 Factor Analysis

Factor Analysis is a statistical technique which reduces larger set of variables into fewer correlated clusters. It is a set of techniques which, by analysing correlations between variables, reduces their number into fewer factors which explain much of the original data more economically and with minimum loss of information (Nargundkar, 2010). The primary purpose of this interdependence technique is to define the underlying structure among the variables that are to be analysed. The large number of variables, most of which are correlated, are reduced to a few number of underlying factors through Factor Analysis (Malhotra, 2008). The primary uses of the Factor Analysis are as follows:

1) To identify the underlying dimensions those explain the correlations among a set of variables.

2) To identify the new smaller set of uncorrelated variables for their usage in further multivariate analysis.
Therefore, Factor Analysis is an interdependence technique of data summarising where a small number of factors are defined that adequately represent the original set of variables. It is also referred as a technique of data reduction which provides the empirical basis for assessing the structure of variables and the potential of creating these representative composite measures for further analysis (Hair et al., 2007). Before running Factor Analysis, there are some pre-requisites such as correlation among variables and data appropriateness, which are to be met.

In the present research work, this technique has been used to identify the underlying factors for two constructs i.e. Customers’ Bank Selection Criteria and Service Quality Variables. For both the scales, all the requirements to run this technique are fully satisfied. After qualifying these requirements, the number of factors has been derived by using Principal Component Method with Varimax Rotation and on the basis of Eigen value. In Principal Component Analysis, the total variance in the data is considered and is recommended where primary concern is to minimise the number of factors that will account for maximum variance in the data (Malhotra, 2008). Eigen value represents the amount of variance accounted for by a factor (Hair et al., 2007). The factor has been taken whose Eigen value is more than one. Variables with higher factor loadings are considered more important while interpreting the factors.

3.5.6 Correlation Analysis

Correlation analysis usually precedes Regression analysis. The correlation matrix provides the extent and direction of linear relationship between different variables. The probability of the problem of collinearity also becomes clear by examining the correlation matrix. However, in order to check the collinearity between variables, VIF (Variance Inflation Factor) for the each variable which is to be used in regression analysis is computed.

3.5.7 Multiple Linear Regression Analysis

Multiple Linear Regression Analysis is a statistical technique to study the relationship between one dependent variable and numerous independent variables. In Multiple Linear Regression, one metric dependent variable and two or more independent variables are involved whose impact or contribution in the variation in the dependent
variable is analysed by using this technique. This technique reveals the extent and direction of the relationship between dependent and independent variables (Kaur, 2005). This technique is used to predict the value of dependent variable when the values of independent variables are known (Hair et al., 2007). This technique is a very powerful and flexible procedure for analysing the relationship between metric dependent variable and several independent variables (Malhotra, 2008).

In the present research work, the above mentioned technique has been performed to study the impact of service quality factors which influence customers’ perception of banking services on customers’ overall satisfaction. To run this technique, Mean Scores (obtained by calculating the average of relative variables under each factor) of the factors extracted by Factor Analysis have been taken as independent variables and overall customer satisfaction as dependent variable which was measured on 5 point scale ranging from 5 to 1 where 5 was for ‘Highly Satisfied’ and 1 for ‘Highly Dissatisfied’. Enter method has been used to get inferences from Multiple Linear Regression. First of all, correlations between the dependent and independent variables have been studied by applying Pearson’s Correlation Method and significant correlations between dependent and independent variables have been found. Regression models usage requires some pre-requisites to be fulfilled and they have to be used very cautiously. If these are run without meeting underlying assumptions, the results arrived may be biased and misleading. In the present study, the condition of linearity of the model and normality of the residual term has been fulfilled. A residual is the difference between the observed value of the dependent variable and the value predicted by the regression model (Malhotra, 2008). The normality of the residuals has been tested by constructing histogram of the residuals together with normality curve. Multicollinearity among variables may influence the overall estimation of the model and can cause problem in estimation of the coefficients of individual variables as well. This problem arises when there is high correlation among independent variables. Therefore, this problem should also be taken care of either by calculating correlations among independent variables or by calculating VIF (Variance Inflation Factor). VIF is the measure of effect of other independent variables on a regression coefficients and large values of it, usually 10 or more cause the problem of multicollinearity (Kaur, 2005). The collinearity status of the independent variables has
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been thoroughly diagnosed, where the values of part, partial and zero correlations among variables, and values of VIF of individual variables have been computed. No problem of multicollinearity among independent variables has been found in the present research work.

3.5.8 Discriminant Analysis

Discriminant Analysis is a statistical technique which serves many purposes and one of the basic uses of this technique is to check the differences between/among the groups. It is appropriate for testing the null hypothesis that the group means of a set of independent variables for two or more groups are equal. In Discriminant Analysis, dependent variable is categorical and this technique is used to classify the people or objects into two or more groups on the basis of some knowledge of their characteristics (Nargundkar, 2010). Discriminant Analysis is used where grouping/dependent variable is categorical and two or more independent variables are there. When there are two groups or categories between which the researcher wants to discriminate, the analysis is called Two-Way Discriminant Analysis and if there are more than two categories, then it is referred as Multiple Discriminant Analysis. In present research, the grouping variable comprises of two categories i.e. rural bank customers and urban bank customers and it has formed only one Discriminant Function (Number of functions = one less number of categories). Therefore, Discriminant Analysis attempts to utilize the independent variables to discriminate among the groups or categories of the dependent variable. Discriminant Analysis works by creating a new variable called the Discriminant Function Score which is used to predict to which group a case belongs and maximize the measure of distance between the groups defined by the dependent variable. The Discriminant Scores are computed according to the statistical rule of maximizing the variance between the groups and minimizing variance within the groups (Hair, et al., 2008). Dependent variable groups are distinguished by scores on Discriminant functions which are based on the values of the independent variables that are multiplied by the function coefficients.

3.5.8a Conducting Discriminant Analysis

Discriminant Analysis involves following steps to be performed:
1) In DA (Discriminant Analysis), we predict group membership. So, first of all, it is examined whether there are any significant differences between groups on any of the independent variables using group means and ANOVA results. If there are no significant group differences, it is not worthwhile proceeding any further with this analysis.

2) The basic assumption in DA is that the variance-co-variance matrices are equivalent. This assumption is satisfied if the outcome of Box’s M statistic comes to be insignificant. Box’s M tests the null hypothesis that the covariance matrices do not differ between groups formed by the dependent and the hypothesis should not be rejected to meet this assumption.

3) DA also demands for absence of multicollinearity among independent variables which can be confirmed from the Pooled within Group Correlation Matrix.

4) The usefulness of the model is based on the significance of Wilks’ Lambda and the low value of Wilks’ Lambda indicates high significance. F-test should show p-value less than .05. Eigen value in the overall model fit represents the ratio of between groups to within group sums of squares and larger Eigen value implies superior function (Malhotra, 2008). The larger the Eigen value, the more of the variance in the dependent variable is explained by that function. Canonical Correlation is the multiple correlations between predictors and the Discriminant function. It is used to measure the association between Discriminant scores and the groups (Malhotra, 2008). The square of Canonical Correlation is the percent of variation in the dependent discriminated by the independents in DA.

5) Standardised Coefficients of independent variables are used to evaluate their contribution to predict the dependent variable. The larger the absolute value of Standardised Coefficients, the better the predictive power of the variable (Nargundkar, 2010). The Unstandardised Discriminant Function Coefficients are used to calculate the Discriminant Z Scores which can be used in classification (Hair et al., 2007). Structure Matrix provides another way of showing the relative contribution of each discriminating variable as a predictor of Discriminant Function and it also follows the same pattern as Standardized Canonical Discriminant Function Coefficients do.
6) Group centroids represent the means of the Discriminant Function scores for each group and provide a summary measure of relative position of each group on the Discriminant Function (Hair et al., 2007). The overall mean of the group centroids is always zero.

7) The more useful measure to assess the utility of a Discriminant model is classification accuracy which compares predicted group membership based on the Discriminant model to the actual known group membership which is the value for the dependent variable. The predictive accuracy of the Discriminant Function is called the ‘hit ratio’ which is given in the classification matrix or can be calculated by adding the diagonal elements on it and dividing by the total number of cases. It reveals the percentage of the cases that are correctly classified by the model.

In the present study, Stepwise Discriminant Analysis has been used to discriminate between rural and urban banks customers, and to present the most discriminating variables. In Stepwise Discriminant Analysis, variables are entered sequentially based on their ability to discriminate between the groups (Malhotra, 2008). We limit the interpretation of relationships between independent variables and groups defined by the dependent variable to those independent variables that met the statistical test for inclusion in the analysis. To run Discriminant Analysis, factor scores (Ermer and Dunn, 1998; Bolat and Wah, 2009 and Gait, 2009) of service quality factors have been taken as independent variables and the geographical location (Hair et al, 2008) of the bank branch has been taken as grouping/dependent variable which is comprised of two groups i.e. Rural Bank Customers and Urban Bank Customers (Wolfe and Fischer, 2003; Warner and Hefetz, 2003; Gulah-Khasnobis and James, 2010). Discriminant Analysis is preferred because it has an advantage over the t-test as it compares two groups in terms of group centroids, thereby taking into account the interactions between the individual variables (Ndubisi et al., 2005).

3.5.9 Miscellaneous

Besides the above discussed statistical techniques, the descriptives such as Means and Standard Deviations have also been used wherever necessary. Percentages,
Frequencies, Bar Graphs, Pie Chart and Weighted Average Scores (WASs) have also been used to analyse the data in present research.

3.6 Limitations of the Study

Due to time and resources constraints, the present study suffers from the following limitations:

1) The study has been conducted in three districts of Punjab i.e. Jalandhar, Ludhiana and Amritsar and sample size is limited to 510 customers.

2) The study is restricted to individual depositors only and that too for the selected personal banking services. The perception of borrowers has not been examined.

3) The study is based on primary survey which has been conducted through a structured questionnaire. The respondents might have deliberately given the responses which they actually do not experience and hence, subjectivity might be present in their responses.

4) Only public sector banks have been selected for the study as the branches of private sector banks and foreign banks are rarely found in rural areas. Likewise, RRBs have also not been considered as they are not located in urban areas.

5) Due to non-availability of the data from published reports, other published documents and websites of the selected banks, the study relies upon the officials of the respective banks for getting the information on the geographical coverage of banking services. In spite of all due and diligent efforts to explore correct position regarding the availability of services in rural and urban branches, the data may not be fully reliable. Moreover, the data are dependent on time and may change when banks launch the services in the branches covered in the study.

6) Specifically, the study is conducted from customer’s perspective. The perspective of the banker with respect to customer satisfaction is missing.

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