Chapter – 4
Research Methodology

4.1 Introduction

The research methodology enunciates the research process. It provides a systematic, planned approach to the research project and ensures that all aspects of the research project are consistent with each other. It is especially important that the research design and implementation be consistent with the research purpose and objectives. Otherwise the research will lose its purpose.

This chapter describes the research design and the procedures for conducting the study. The chapter explains the methods used in carrying out the study, giving special emphasis to the measurement of variables. Specifically, this chapter describes the instrument development including pilot testing and the sampling, data collection, and data analysis procedures.

4.2 General Perspective

The research reported here embodied a quantitative perspective. Even though this study touches different areas of diagnosis, description and even exploration in the selection and linking of variables, the type of research is designated as diagnostic research and finally experimental design. The research method used to collect data was sample survey method. Other methods of data collection were found unsuitable in this context, especially considering the sample size and hence ignored.

4.3 Research Design

While every research project is different yet there are enough similarities among research projects to enable us to categorize them by the research methods and procedures used to collect data and analyze data. Research Design is the science (and art) of planning procedures for conducting studies so as to get the most valid findings.
Research Design is the framework or plan for a study (research) used as a guide in collecting and analyzing data. It is also a blueprint to follow in completing a study.

4.4 Research Problem

The first step in designing the research is to identify a research problem or issue to investigate. Defining the problem is the most important step in the research process. Why? What else matters if we have defined the problem incorrectly? The title of the thesis is *A Comparative Study of Islamic System of Accounting & Finance with Conventional System of Accounting & Finance*.

The problem here is identified in terms of understanding the relationship between various aspects of Islamic pattern and conventional pattern of finance.

The researcher identified the following as the research questions which will solve the research problem or issue:

- What are the key determinants for practicing or not practicing Islamic System of Accounting & Finance?
- What is the degree of importance of these factors?
- What are the key factors that segregate the Islamic System of Accounting & Finance for the two major communities Siha & Sunni?
- What are the different modes of financing in Islamic System of Accounting & Finance?

4.5 Variables

The variables in this study are –

1. Banking Environment
2. Motivation for investment
3. Methods of Practicing Accounting
4. Capital investment Environment
5. Governance
6. Regulatory Framework
The changes in these bring out an environment of complex scenario of favorable atmosphere and unfavorable environment, and the oscillation is between both the situations in which the factors become the driving forces or the restraining forces. Grouping the favorable and unfavorable elements in the changes of the above factors will be the appropriate strategy to weigh consequences.

4.6 Identifying Information Types and Sources

Basically, two types of information are available to a researcher, secondary data and primary data. The major type of information utilized by us is primary data. This is done through questionnaire and one to one interview at the place of discussion. The literature review is a secondary data type. The sources have been books, periodicals, websites, printed literature about the industry etc.

How is this accomplished? It depends largely upon the type of data needed. Compared to the primary data, accessing secondary data is relatively easy, especially in today’s age of the internet. The survey research methods have been employed for accessing the primary data. This has been taken care of through designing of the Questionnaire and self-administered: face to face interviews.

4.7 The Sampling Design Process

Under this heading details, details about the population, sampling frame, sampling unit, sampling procedure, sample size and contact method have been provided.

4.7.1 Population

The objective of the study is to identify determinants for practicing or not practicing Islamic System of Accounting & Finance. Further the study analyzed the key factors that segregate the Islamic System of Accounting & Finance for the two major communities Siha & Sunni. The universe or the population is thus the Muslim communities Siha & Sunni in Odisha.

4.7.2 Sampling Frame

A sampling frame is a representation of the elements of the target population. It consists of a list or a set of directions for identifying the target population. The list from which the respondents are drawn is referred to as the sampling frame or working population.
The cities selected for each segments are as follows:

1. City – Cuttack & Bhubaneswar - 119
2. Urban – Kendrapara, Khordha, Jajpur & Bhadrak - 84
3. Semi-urban – Salipur & Niali - 81
4. Rural – Pipili & Kaipadar-36

4.7.3 Sampling Unit

Who is to be surveyed or who can constitute the sampling unit, is very critical and needs to be answered rightly since the proper prediction about population can be made only when the sampling units are the true representative of the population. Sampling unit for this study is both Siha & Sunni Muslims who are aware of both Islamic and conventional method of accounting & finance system.

4.7.4 Sampling Technique

The sampling technique was proportionate stratified Random sampling. This method of selecting samples is mixture of the deliberate and random sampling techniques. It is a method used for increasing the precision of sampling.

4.7.5 Sample Size

The size of sample is determined by using the following formula:

\[ N = \frac{Z^2 \cdot p \cdot q}{e^2} \]

(Nargundkar 2004)[33] pp92-96

The ‘z’ value represents the Z score from the standard normal distribution for the confidence level desired by the researcher. For example, a 95% confidence level would indicate (from a standard normal distribution for a two-sided probability value of 0.95) a Z score of 1.96. Similarly, if the researcher desires a 90% confidence level, the corresponding Z score would be 1.645 (again, from the standard normal distribution, for a two-sided probability of 0.90). Generally, 90 or 95 per cent confidence is adequate for most marking research studies. A 100 per cent confidence level is not practical, as it means we have to take
a census of the entire population, instead of using a sample. In our research, we have a 95% confidence level. Hence, our $Z$ value is 1.96 and $Z^2$ is 3.8416.

The ‘$p$’ is the frequency of occurrence of something expressed as a proportion. For example, if the number of users we would expect to find in a sample is 1 out of every 4 respondents, ‘$p$’ would be 1/4 or 0.25. In our research, out of 3 individuals, 1 is Muslim (either Siha or Sunni). Hence, our ‘$p$’ value is 1/3 or 0.33.

The ‘$q$’ is simply the frequency of non-occurrence of the same event, and is calculated as (1-$p$). In other words, ‘$p$’ and ‘$q$’ always add up to 1. It should be noted that we are actually trying to determine ‘$p$’ or estimate ‘$p$’. In this research for determining ‘$p$’ value a pilot study would be conducted. In our research, the ‘$q$’ value is (1 $- p$) = 0.67.

The ‘$e$’ is called tolerable error in estimating the variable in question. This can be decided only by the researcher for the study. The lower the tolerance, the higher will be the sample size. The higher the tolerable error, the smaller will be the sample size required. In our research, we have a 95% confidence level. This means we can afford to have 5% error or $e = 5\%$ or .05, thus $e^2 = 0.0025$.

Now, putting the values of $Z^2$, $p$, $q$ and $e$ in the above equation we get the sample size $N = 339.75$. But for our convenient and uniformity we have take the sample size of 320.

4.7.6 Sampling Process

The target population for the study consisted of the Muslim (either Siha or Sunni) in Odisha. The survey was based on the random visit at random times for interaction without any bias or judgment. The study was also undertaken at the respective places at different times to further minimize the bias. The method used for the data collection was a face-to-face interview, using a structured questionnaire, with closed-ended questions.

4.8 Contact Method

At the pilot stage as also during the actual survey stage, the questionnaires were filled by interviewing them personally. The questionnaire was pre-tested using a convenience sample of approximately 50 respondents. Final data was collected over a period of more than 24 months. The study included a variety of cities, urban, semi-urban and rural areas to minimize any bias.
4.9 Collection of Data

Data collection is extremely important because, regardless of the data analysis methods used, data analysis cannot ‘fix’ the bad data. The data was collected on the Questionnaires personally to minimize the non-sampling errors. The questionnaires were not got filled up from the non interested or ‘much in a hurry’ respondents.

4.10 Ethical Considerations

One of the most important ethical principles is that coercion should not be used to force people into taking part in research. The researcher did not offer any financial or other material rewards to induce people to take part in the research, to avoid biased results. Participants were given fair and accurate information about the research and were told how much time it would most probably take to fill the questionnaire. Anonymity and confidentiality was offered to all the participants in the research. The participants were informed that the data collected would be used in such a way that the information would not be traceable to any particular individual.

4.11 Research Instrument

A structured questionnaire was developed to collect data on the variables in this study. The pilot was administered to 50 respondents.

**Section 1:** Demography

**Section 2:** Aspects of Islamic pattern and conventional pattern of finance.

**Section 3:** Importance to Islamic accounting system over conventional pattern of accounting.

**Section 3:** Effectiveness of Different Modes of Financing.

4.12 Pilot Study

Pilot Study or Pretesting refers to the testing of the questionnaire on a small sample of respondents to identify and eliminate potential problems. The main objectives of the pilot survey was to test whether the survey questions were fully or rightly understood by the respondents and to examine the effectiveness of the questionnaire in terms of structure, presentation etc. The sample size of the pilot survey is mainly a subjective decision of the
survey administrator, since there are no rules and formulas that can tell how large the pretest should be.

Usually the sample size depends on the complexity of the issues being studied and the size of the full survey. Hence a total of 50 pilot interviews were conducted among the target respondents. All aspects of the questionnaire including question content, wording, sequence, form and layout, question difficulty, and instructions were tested. Care was taken to see that the respondents in the pre-test were similar to those who would be included in the actual survey in terms of background characteristics, familiarity with the topic, and attitudes and behaviors of interest. Further participants who were part of the pretest were excluded from the final survey.

4.13 Statistical Analysis

After the collection of research data, an analysis and interpretation of result is necessary. The purpose of analysis is to build up a sort of empirical model where the relationship involved is carefully brought out so that some meaningful inferences can be drawn. Analysis of data is to be made with reference to the purpose and objective of the study and its possible bearing on the facts that are to be revealed. In this chapter we analyze the research data. The data preparation began as soon as the first batch of questionnaires was received from the field, while the fieldwork was still under way. This was done to ensure that if problems were detected, the fieldwork could be modified to incorporate corrective action, if any.

Once data has been collected in the form of filled up questionnaires, the next step is to process it. There are two steps for doing analysis of data:

1. Data Processing
2. Statistical Analysis

Data Processing

When the data were collected by questionnaire, the next steps are coding data and entering data to computer for getting necessary output. Using statistical packages like SPSS (Statistical Package for the Social Sciences) is nowadays necessary for managing data generated by a field survey. Coding refers to the process of grouping and assigning numeric codes to the various responses to a particular question. In this research most of questions are
close-ended and numeric codes have been assigned to the various responses on the questionnaire.

**Statistical Analysis**

Statistical analysis step will be started after data processing. With the help of statistical packages we can do a lot of statistical test such as test of reliability, Chi-Squared test, t-test etc. These packages can also have varying graphical capabilities for drawing graphs. Our plan in this research for doing statistical analyses which are suitable for our aims of the study is as following:

1. Test of Reliability
2. Univariate Analysis

**Data Analysis Strategy**

Data analysis is not an end in itself. Its purpose is to produce information that will help address the problem at hand. Various statistical tools and techniques have been used to analyze the data. Statistical techniques can be classified as Univariate or multivariate.

1. For metric data test of hypothesis for one sample, Independent sample t test for 2 samples, and paired-sample t test for dependent samples and One-way ANOVA for more than two samples were used.

2. Multivariate techniques were used to study the simultaneous relationships among two or more phenomena. Multivariate techniques differ from Univariate techniques in that they shift the focus away from the levels (averages) and distributions (Variances) of the phenomena, concentrating instead upon the degree of relationships (correlations or covariance) among these phenomena. Multivariate statistical techniques can be classified as dependence techniques or interdependence techniques.

3. Dependence techniques were used where one variable was identified as the dependent variable and the remaining as independent variables. The dependence techniques used were Multiple Regression and Discriminant analysis. Interdependence techniques were used when the variables could not be classified as independent or dependent; rather the whole set of interdependent relationships was examined.
4. The interdependence techniques used for the present research were Factor Analysis, which was used for examining variable interdependence and Cluster Analysis, which was used to analyze object similarity.

All hypothesis tests were reported according to the statistical procedure. The conclusion was stated using the p value approach. The p value is the probability of observing a sample value as extreme as, or more extreme than, the value actually observed, given the null hypothesis is true. All hypothesis tests were carried out using 5% level of significance. A 5% level of significance was found to be the right tradeoff between Type I error and Type II error. The decision rule for hypothesis testing was —If the probability associated with the calculated or observed value of the statistic is less than the level of significance (α), the null hypothesis is rejected.

**Reliability Analysis**

“The tools used for research have to be designed by using the process and techniques of factorial design, correlations, mean, and standard deviation, and many more. According to Saunders et al. (2000), reducing the possibility of getting the answer wrong means that attention has to be paid to two particular emphases on research design”:

1. **Reliability**
2. **Validity**

“According to Hair et al. (1998) validity is the degree to which a measure accurately represents what it is supposed to do and ensuring validity starts with a thorough understanding of what is to be measured and then making the measurements as correct and accurate as possible. Validity is concerned with if the researchers have studied what they intended to do and nothing else. However, accuracy does not ensure validity”.

“The reliability is the degree of accuracy of the collected data. i.e. if the study is repeated, the identical results were emerged. There are various reliability coefficients. The most commonly used is Cronbach’s alpha. This coefficient is based on average correlation of items within a test if the items are standardized”.

If the “items are not standardized; it is based on average covariance among the items. The value ranges from 0 to 1, since it is interpreted as correlation coefficient. The SPSS also provides standardized item alpha, that is, the value that would be obtained if all items were
standardized. Apart from Cronbach’s alpha, in SPSS we can analyze the reliability based on Split half reliability, Guttmann, Parallel and strictly parallel”.

**Factor Analysis**

“The primary data consisted of 320 replied questionnaires with 45 separate metric variables” pertaining to the factors related to Islamic accounting system and Conventional accounting systems. “In this research, the perceptions of Muslim community related to Islamic accounting system and Conventional accounting systems on forty five attributes are examined to first understand if these perceptions can be grouped and secondly reduce the forty five variables to a smaller number”.

“The forty five number of perceptions examined presents a complex picture of 2025 (45 X 45) separate correlations. If the forty five variables can be represented in a smaller number of composite variables, then we can understand that the factor analysis should be the best proper technique to analyze the data. Understanding the structure of perceptions of variables requires R-type factor analysis and a correlation matrix between variables as the case of this research presents the above requirements. Considering that we used the metric variables for this research, so they constitute a homogeneous set of perceptions and appropriate for factor analysis”.

The interdependence techniques used for the present research were Factor Analysis, which was used for examining variable interdependence and Cluster Analysis, which was used to analyze object similarity.

**Multiple Dichotomy Analysis**

The objective of this analysis in our research is to determine the effectiveness of various modes of Islamic financing. The research shows the effectiveness of various modes of financing as opined by the 320 respondents. As multiple mode of financing was done by the respondents, we used multiple dichotomy analysis method for study

**One Way ANOVA**

For this study, we have taken five selected demographic factors namely – Age, Domicile, Income, Qualification and Occupation. The following hypotheses are developed to facilitate the comparative study.
The above hypotheses are tested by using One Way ANOVA as it satisfies all the prior condition of its use. “When we want to compare means of more than two groups or levels of an independent variable, one way ANOVA is used. ANOVA is used for finding significant relations. ANOVA is used to find significant relation between various variables. The procedure of ANOVA involves the derivation of two different estimates of population variance from the data. The statistics is calculated from the ratio of these two estimates. One of these estimates (between group variance) is the measure of the effect of independent variable combined with error variance. The other estimate (within group variance) is of error variance itself. The F-ratio is the ratio of, between groups and within groups’ variance. In case, the null hypothesis is rejected, i.e., when significant different lies, post adhoc analysis or other tests need to be performed to see the results”.

“ANOVA tests the null hypothesis that the means of all groups being compares are equal, and produces a statistic called F. If the means of all groups tested by ANOVA are equal, fine. But if the result tells us to reject the null hypothesis, we perform Brown Forsythe and Welch test options in SPSS”.

The ANOVA test is a parametric test which assumes:

“Population normality - data is numerical data representing samples from normally distributed populations”.

“Homogeneity of variance – the variance of the groups is “similar”. The sizes of the groups are “similar”. The groups should be independent”.

“If significance value is less than 0.05, reject null hypothesis. This means variance of groups is significantly different. If this assumption is broken then Brown-Forsythe test option and Welch test option display alternate versions of F-statistic. If significance value is less than 0.05, reject null hypothesis”.

Post Hoc analysis involves hunting through data for some significance. This testing varies risk type I errors. Post hoc tests are designed to protect against type I errors, given that all the possible comparisons are going to be made. These tests are stricter than planned comparisons and it is difficult to obtain significance. There are many post hoc tests. More the options, stricter will be the determination of significance. For metric data test of hypothesis for one sample, Independent sample t test for 2 samples, and paired-sample t test for dependent samples and One-way ANOVA for more than two samples were used.
4.14 Conclusion

In the course of this study, it is expected that the methodological approach utilized would overcome the methodological limitations observed in many related previous research. In order to develop this methodological approach to address this objective, it was first necessary to make some assumptions. One such assumption is that all respondents will have the same exposure to the intervening variables like conventional and Islamic accounting. Therefore, the effects of these factors will be common to all regardless of how they responded. It is also assumed that for an explorative study design like this face validity by experts is enough for measures that have no reported reliability and validity values. Further, it is assumed that the samples have the quality of representativeness of the population. Finally, it is assumed that the data obtained on interval level fulfill the requirement for carrying out the research.