CHAPTER-VI

Research Methodology

6.0: Introduction

As discussed in chapter 1, the proposed study is decided to be undertaken with the help of a specially designed questionnaire. This chapter discusses the process through which the questionnaire has been evolved and the methods through which the data obtained from the responses of the questionnaire were processed and analyzed to identify the interacting role of loan from public sector banks upon the elements of loan services that are necessary to be utilized in the process of MSME enterprises.

The focus of the study is primarily on the independent variable – dimensions of the utility of PSBs loan services being individual and subsequently understanding influences upon the financial performance and capital formation of the enterprises. In an effort to identify the determinants of the independent variables, different factors have been considered which are presented in various dimensions or constructs. Due to the unique nature of the study, no previously tested and standardized data are used for the current study.

6.1: Research Design

In this present research work, the objective is identified and research work to be undertaken is defined clearly. Hence, it requires designing the research. In research design, a complete guideline for data collection is obtained. The main contents of the research design are

1. Selection of research approach
2. Design of population sampling
3. Design of sample size
4. Design of sampling plan

6.1.1: Selection of research approach

The present study is an exploratory research work in nature.

6.1.2: Population Sampling

The target population of the present study, the MSMEs of the districts of East and West Medinipur of West Bengal state who have got loan from Public Sector Banks and doing their business. The estimated population was 5973 units who were registered at respective District Industries Centre (DIC) in the year 2010-11 to 2014-15.

6.1.3: Sample Size

After knowing the estimated population, the sample size of the MSMEs for collecting primary data has been determined using the Cochran's formula.

According to Cochran's formula[1], the sample size is estimated as follows:

Cochran's formula for calculating sample size when population size is finite i.e., 10,000 or less is **(n=$\frac{n0}{1+\frac{(n0-1)}{N}}$)** which is used in the present study:

$$n=\frac{n^0}{1+\frac{(n^0-1)}{N}}$$

$$n=\frac{384}{1+\frac{(384-1)}{5973}}$$

$$=360$$

[Where, n^0= 384 i.e., sample size for infinite population according to Cochran's formula, n= Sample size, N= Population Size]

Therefore, the sample size in this study was 360.

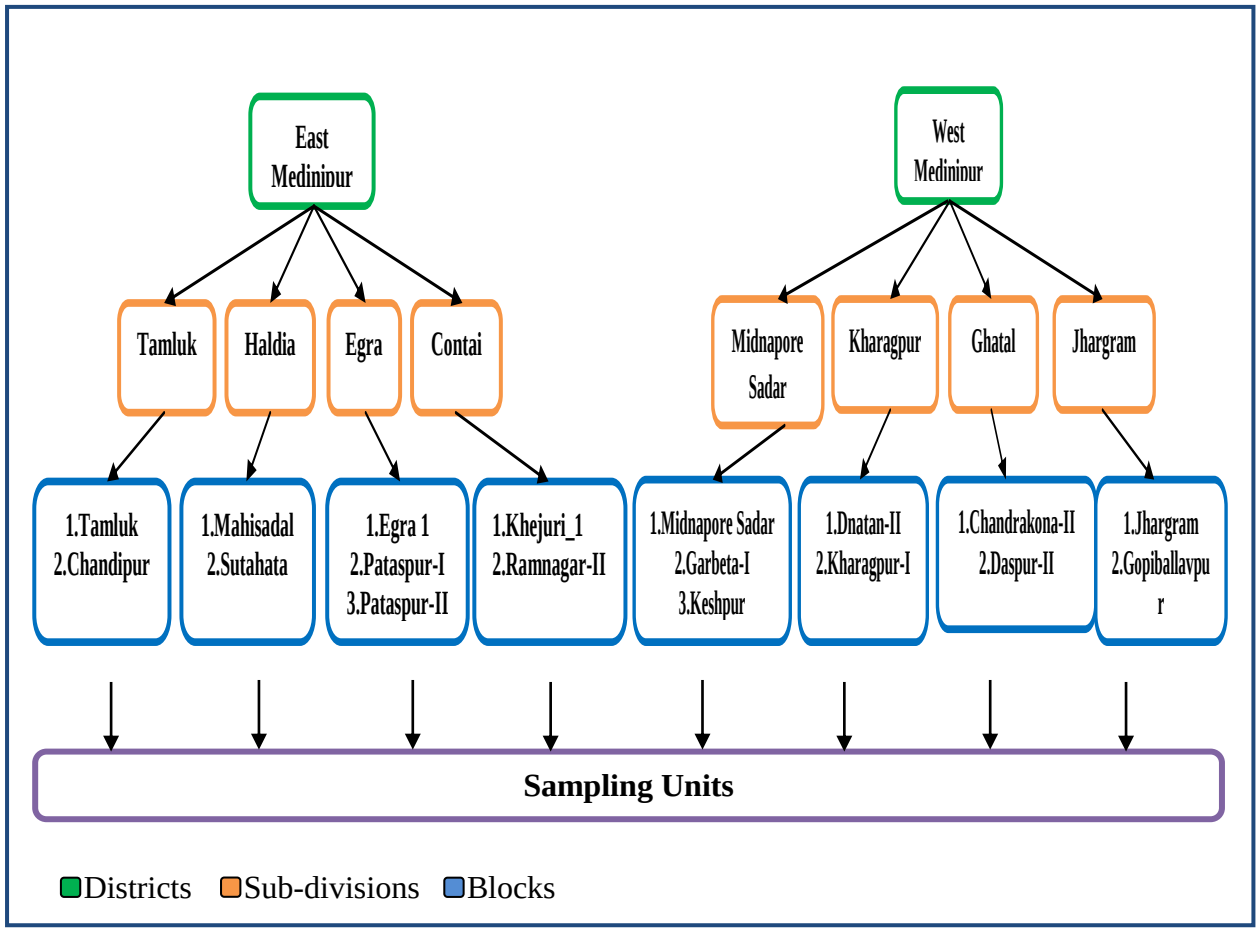
[1] **Cochran, W. G. (1977).** Sampling techniques (3rd ed.). New York: John Wiley & Sons.

6.1.4: Design of sampling plan

A sampling plan is a mechanism by which sampling units of study are selected from the frame of the population. The suitable selection of sampling plan in a study is essential for the reliability of inferences of a study. The sampling plan may be probabilistic and non-probabilistic. However, for the existing research work, the probabilistic sampling plan is used.

For this research work, to draw the estimated sample size, the stratified random sampling technique is used. The study is based on two districts and each district is divided into four sub-divisions. A list of Blocks in each sub-division has been prepared. Blocks are randomly selected from each list by using the random number method. Thus the total 18 blocks are selected for the study. Again a list of enterprises in each selected block is prepared. And again using random number method, 20 enterprises are selected from each block. Thus the total 360 sample units are selected from the two districts. The following figure shows the details of the sampling plan which is used in the present study:

Figure 6.1: Sampling frame



6.2: Development of Research Instrument

6.2.1: Dimensions/Constructs development for the Instrument

Operational Definition of the four sections

A. Utility of Banks loan

The Utility of PSBs' loan is captured through the following five dimensions:

1. Availability (5 Items):

One of the purposes of banks, especially of the banks under government sectors, is to cater Micro, Small and Medium Sector Enterprises (MSMEs) in respect of their monetary

need – need in different perspectives like seed money, fixed and working capital, growth, etc.

By availability we mean to what extent the PSBs reach out to the clients with variant loan facilities. The five items are developed in such a way that the availability of financial support from the PSBs is reflected through the questions asked.

2. Accessibility (5 Items):

Accessibility refers to what extent banks come forward in providing loans to meet up exact purpose which the MSMEs can access. For entrepreneurs being genuinely interested in the growth of their MSMEs with public sector loan, the accessibility should not be a hindrance. Hence five items are developed to capture the Accessibility of Public Sector Banks.

3. Expected Reliance (4 Items):

Expected Reliance measure to what extent the entrepreneurs rely upon the sources of fund. The entrepreneurs have experienced that loan accessed from alternative sources other than PSBs, like, Private sector banks, NBFCs, Indigenous Bankers, etc. is not reliable. Hence four items are developed to measure the Expected Reliance of the entrepreneurs.

4. Facilities (4 Items):

Bank facilities reflect the additional benefits or add-on services given to the customers in connection to sanctioned loan. Hence we tried to measure the bank facilities with the help of four items.

5. Terms and Conditions (4 Items): These are general terms and conditions linked to a specific loan which a customer has to comply with. And, another four items were asked to understand the terms and conditions applied to them.

B. Utilization of Loan (7 Items)

Utilization of loan funds represents how entrepreneurs allocate and disbursed the allocated loan funds to meet up the financial obligations in a cost-efficient manner. It also represents the status of working capital management of their enterprise. The Utilization of loan is surveyed through seven items.

C. Financial Performance (3 Items): financial performance is measured through the firm's profitability in terms of net cash flow, net profit, and growth of annual sales. Hence, we have used three items to understand the attitude of the entrepreneurs regarding the financial management of the enterprises.

D. Capital Formation (6 Items): Capital formation is the surplus fund generated through a firm's operation in a cycle of production for further investment. Business in case of operation on a larger scale finds the prospects of higher profit and thus systematic growth of capital. Such a situation gradually eliminates the dire need of looking for fund towards external sources and come over starvation in growth. This is captured through the six items.

6.2.2: Items / Statements development for the Instrument

In order to collect the response on the dimensions/factors of Utility of Bank Loan that has an impact on the Financial Performance of the MSMEs, a survey method is conducted with a self-structured questionnaire shown in the Appendix A. The aim of the

questionnaire is to investigate Impact of Utility of Bank Loan in a business, how much the entrepreneurs are satisfied with their loan, how much they are able to utilize the loan fund and to create the capital for present and future business and also with this how much they have improved their business financial performance. For the purpose of the collection of data, we have developed a self-structured questionnaire where the questionnaire has two parts- the first part seeks background information of the respondents and the second part captures the study variables. Among the study variables, Section A contents five important dimensions for measuring entrepreneurs' feelings on Utility of bank loan. Section B, C, and D measure the Utilization of Loan, Financial Performance and Capital Formation of the enterprises respectively. The nature of all the statements in the questionnaire was close-ended. A five-point Likert's Scale is used. Where 1 stands for Very insignificant, 2 stands for insignificant, 3 stands for fairly significant, 4 stands for significant, and 5 stands for very much significant. Similarly, financial performance has also measured with the Likert's Scale where 1 stands for Negligible, 2 stands for Little Extent, 3 stands for Moderate Extent, 4 stands for Great Extent, and 5 stands for Very Great Extent.

These questionnaires will be given to respondents who are considered to be relevant for the study and conscious to their feedback. The feedback is taken from 267 respondents, amount to nearly 39*267= 10413 data.

The initial questionnaire used in the pilot study is modified and presented in Table 6.1:

Table 6.1: Items of the Dimensions

Dimensions	Items
Availability	Public Sector Banks developed different type of loan schemes for the growth of MSMEs.

	The schemes are designed to meet the need of this desired group of enterprise
	Te schemes are very transparent grip and within the ability of common entrepreneurs.
	How will you rate your experience regarding the process of getting loan with the Public Sector Bank
	The Bank was able to fulfill your Expectation
Accessibility	Entrepreneurs in this locality who are facing hardness to get money from other source used PSBs money for their growth.
	Now a day's these loans are easily accessible to start-up a business.
	PSBs loan fund is used by the entrepreneurs for their business growth
	The purpose of this fund is for growth of people in general and it is encouraged by Bank authorities.
	People unable to get money from other sources, use this source for growth of personal venture etc.
Expected Reliance	PSBs loan fund is used by other entrepreneurs for their economic development
	PSBs loan fund is very much dependable and reliable.
	PSBs loan fund has been used by me earlier satisfactorily
	Entrepreneurs are satisfied with the bank dealings
Facilities	PSBs gives the scope of strategic development of the firm
	There is special provision for subsidy
	Bank gives special discount in interest in case of repaying before the time of repay
	Bank gives special look in case of bad time of business
Terms and Conditions	Earlier loans had been taken and complied with the terms and conditions.
	There are provisions to make the terms and conditions flexible in genuine causes.

	Since the terms and conditions are a soft and pro-people need. People mostly comply with these.
	Terms and conditions are regularly development economic growth to meet the need of Entrepreneurs
Utilization of Fund	Entrepreneurs are able to allocation the loan fund on a priority basis
	Entrepreneurs are able to disburse the allocated fund to the stakeholders
	The fund helps to meet up the Working Capital Management
	All transactions are completed timely in a cost-efficient manner
	Allotted funds keep little financial obligations for the next cycle of production
	Funds are sufficient to recover due financial liabilities if any
	Entrepreneurs are able to control the transaction as required basis
Capital Formation	Using this loan, the capital generated in the form of surplus is up to the expectation.
	After returning the principal amount with interest, the excess fund is sufficient for capital investment.
	Capital generation is sufficient for the expansion and growth of the firm.
	There is a growth of capital year wise.
	The business has come over the shortage of net business fund if any on utilization of loan amount.
	Long term fund requirement is met from this bank loan.
Financial Performance	Net Cash Flow increased in business
	Annual Sales increased
	Sufficient growth in Net Profit.

Using the questionnaire, the survey had been conducted among population belonging to different groups and is well aware of the situation to make the work truly representative. In all feedback from 267 respondents has been taken for analysis in this study.

6.3: Study Area and Data Collection

6.3.1: Study Area

Two districts, East and West Medinipur of West Bengal are selected for the study. These two districts were selected purposively as these two districts are playing an active role in the development of the MSME sector of the State. In the year 2014-15, West Bengal holds 8th position in India to filled EM-II. In West Bengal, districts East and West Medinipur held the position 8th and 4th respectively among the thirty two districts of West Bengal.

Administratively East Medinipur is divided into four sub-divisions, twenty six developed Blocks, and 8 Municipalities, and West Medinipur is divided into four sub-divisions, twenty nine Blocks, and 8 Municipalities.

6.3.2: Data Collection

The present study used both the data primary as well as secondary data. The secondary data depict the present scenario of growth and development of MSMEs in India, West Bengal, as well as the study areas. The primary data are analysed to achieve the objectives of this present study. The researcher visited the District Industries Centre (DIC) of both the districts and collected the registered units in the last five years. The self-structured questionnaire after verification with the help of the pilot study was distributed and collected personally. The researcher explains the method of responding to the respondents. The researcher promises the confidentiality of the responses. The questionnaire is distributed to 360 respondents (following Cochran's formula) but 271 complete responses are obtained having a response rate 75.2%.

6.4: Pilot Study

The pilot test was done to improve the wording, sequence, appropriateness, and clarity of the final version of the questionnaire. The questionnaire includes all the sections i.e., demographic profile, Utility of PSBs' Loan, Utilization of Loan, Capital Formation after using the loan and Financial Performance of the enterprise. The preliminary questionnaire is pre-tested to check the reliability of each variable. So, we select 20 entrepreneurs as an expert using convenience sampling. we analysed the gathered the responses. We made the necessary changes as per the suggestions made by the experts to make it easily understandable by the respondents. The questionnaire is tested with calculating the Cronbach's alpha. We remove only three items to get Cronbach's alpha value more than 0.60 for the whole questionnaire and dimension wise. Finally, out of forty two variables, thirty nine variables have been used for the main study and it is then considered as reliable for the present study.

6.5: Data Screening and Pre-Analysis

Raw data may contain irregularities and abnormalities, (Hernandez & Stolfo, 1998)[2]. Defected data are a cause of inaccurate analysis; therefore data needs to be screened by applying statistical tools for necessary correction before doing the main analysis. In the present study, assessment of missing data, assessment of multivariate outliers, normality test and assessment of multicollinearity have been done prior to processing with statistical analysis.

6.5.1: Assessment of Missing Data

The indication of a missing data is when a respondent failed to deliver his opinion intentionally or unintentionally except in a situation where the respondents were asked to

[2] **Hernandez, M. A., & Stolfo, S. J. (1998).** Real-world data is dirty: Data cleansing and the merge/purge problem. *Data mining and knowledge discovery*, *2*(1), 9-37.

skip the questions in one or more questions thus making the data collected not appropriate for ensuing analysis (Hair et al., 2010[3]; Howell, 2007[4]). Also, the data coding error or entry error by the researcher are the sources of occurrence of missing data.

6.5.2: Assessment of multivariate Outliers

The next step of data screening is the analysis of multivariate outliers. It is known that outliers are the extreme scores or values which are distinctly different in the data sets. The data analysis or the result extracted from the data analysis of a study may be significantly affected by the outliers (Hair et al., 2010). An outlier may be due to variation in the measurement and can perhaps show an experimental error (Churchill Jr. & Iacobucci, 2004)[5]. Presence of outliers in the data set can utterly distort the following data analysis and lead to erroneous results (Verardi and Croux, 2008)[6]. Investigating outliers is an important step because skipping initial examination of outliers can distort statistical tests if it happens to be problematic outliers (Hair Jr et al., 2010). In particular, it distorts statistics and may lead to results that do not simplify to certain sample except one with the same type of outliers (Tabachnick & Fidell, 2013)[7]. There are two types of outliers – univariate outliers and multivariate outliers. In this study, univariate outliers were not identified as the Likert's five-point scales was used to collect the data. Multivariate outliers can be identified by using Mahalanobis distance (D2) and Cooks distance test.

6.5.3: Normality Assessment

[3] **Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2010).** *Multivariate Data Analysis*. 7th ed. New York: Pearson

[4] **Howell, D.C. (2007).** The treatment of missing data. *The Sage Handbook of Social Science Methodology*. London: Sage. p208-224

[5] **Churchill, G.A.Jr., & Iacobucci, D. (2004).** Marketing Research - Methodological Foundations. 9th ed. Mason, OH: Thomson.

[6] **Verardi, V., & Croux, C. (2008).** Robust regression in Stata. *The Stata Journal*, *9*(3), 439-453.

[7] **Tabachnick, B.G., & Fidell, L.S. (2013).** Using Multivariate Statistics. 6th ed. New Jersey: Pearson Education Inc. p1-983.

Several statisticians (Hair et al., 1998; Coakes & Steed, 2007[8]; Tabachnick & Fidell, 2007[9]) mentioned that normality can be assessed to some extent by obtaining skewness and kurtosis values. Skewness and Kurtosis value provides the indication of the *symmetry* and *peakedness* of the distribution. Based on the rigorous data cleaning steps we undertook in light of recommendations from Kline (2011)[10] and Hair et al., (2010). All observations fall within the acceptable range i.e. within ±3 standard deviations of the mean for skewness indices and within ±10 for kurtosis indices (Kline 2011). Therefore, in this study, the main focus to determine the normality of the data has been mainly on the statistics of Skewness and Kurtosis. The test of normality is run for every individual item on the questionnaire of the study individually.

6.5.4: Assessment of Multicollinearity

The test of multicollinearity among the independent variables for the data screening is tested first by examined correlation matrix and secondly by tolerance and VIF level of the independent variables. The correlation matrix of the independent variables is examined to find out if there is any indication of high correlations among the variables. Multicollinearity problem occurs when a high correlation exists among the independent variables to each other (Pallant, 2010[11]; Hair Jr et al., 2010; Tabachnick & Fidell, 2013). Pallant (2010) suggested that a correlation value above 0.7 as a threshold for multicollinearity among independent variables.

6.6: Validity and Reliability

[8] **Coakes, S. J., & Steed, L. (2007).** SPSS Version 14.0 for Windows: Analysis without anguish. *John Wiley & Sons Australia Ltd., Australia*, *3*(1), 15.

[9] **Tabachnick, B.G., Fidell, L.S. (2007).** Using Multivariate Statistics. 5th ed. Boston, MA: Allyn & Bacon/Pearson Education.

[10] **Kline, R. (2011).** Principles and practice of structural equation modeling, (2nd ed.). New York: The Guilford Press.

[11] **Pallant, J. (2010).** SPSS survival manual: A step by step guide to data analysis using SPSS. Maidenhead.

In the present study, the testing of the validity and reliability of the questionnaire is essential. The details discussion of the validity and reliability are given below.

6.6.1: Content Validity

It is the process of matching the test items with the instructional objectives. It is a non-statistical type of validity. Content validity is defined as the extent to which a test measures a representative sample of the subject matter content and the behavioural changes under consideration. A pilot test is performed which is confirmed the content validity with the items of the entire constructs of the questionnaire. Again the constructs of the dependent variables were confirmed by some experts.

6.6.2: Construct Validity:

Construct Validity is concerned with determining whether the instrument measures what it is actually intended to measure, (Churcill, 1995)[12]. The measures of validity refer to correct and adequate operational measures for the concept being tested, (Malhotra, 1996)[13]. In 1959, Campbell and Fiske proposed convergent and discriminant validity. Therefore, in this study, construct validity is examined by using convergent and discriminant validity with the help of factor analysis. Convergent validity is tested by finding whether the items of the same factor are correlated and discriminant validity was used by finding the correlation among the factors. Convergent and discriminant validity is established by using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The convergent and discriminant validity are explained as follows:

[12] **Churchill, G. A. J. (1995).** Marketing Research – Methodological Foundations. 7th ed. Fort Worth, TX: The Dryden Press.

[13] **Malhotra, N. K. (1996).** Marketing Research: An Applied Orientation. 2nd ed. Upper Saddle River, NJ: Prentice Hall.

6.6.2.1: Convergent Validity

For adequate convergent validity, in the pattern matrix of exploratory factor analysis (EFA), it is expected that items belonging to the same construct should show evidence of average factor loading of 0.60 or higher on a single factor. In the case of confirmatory factor analysis (CFA), AVE should be greater than 0.5 and the composite reliability should be greater than 0.7, (Byrne, 2001[14]; Fornel & Larcker, 1981[15]).

6.6.2.2: Discriminant Validity

First, to establish the discriminant validity using Exploratory factor analysis, it was expected that the correlation between the item of one factor with the other factor should be 0.30 or less (Bhattacherjee, 2012)[16]. Second, to establish discriminant Validity using confirmatory factor analysis, the MSVs should be less than AVEs and greater than corresponding ASVs in all cases (Chin, 1998[17]; Hair et al., 2006[18]).

6.6.3: Reliability

The most popular test of inter-item consistency reliability is Cronbach's Alpha Coefficient (Cronbach's alpha: Cronbach, 1951)[19] which is used for multipoint scaled

[14] **Byrne, B. M. (2001).** Structural equation modeling with AMOS, EQS, and LISREL: Comparative approaches to testing for the factorial validity of a measuring instrument. *International journal of testing*, *1*(1), 55-86.

[15] **Fornell, C., & Larcker, D. F. (1981).** Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research*, 382-388.

[16] **Bhattacherjee, A. (2012).** Social science research: Principles, methods, and practices.

[17] **Chin, W. W. (1998).** The partial least squares approach to structural equation modeling. *Modern methods for business research*, *295*(2), 295-336.

[18] **Hair, J.F.Jr., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (2006),** Multivariate Data Analysis. 6th ed. New Jersey: PrenticeHall International Inc.

[19] **Cronbach, L. J. (1951).** Coefficient alpha and the internal structure of tests. Psychometrika, 16, 297−334.

items. The higher the coefficients, the better the measuring instrument. The thumb rule for measuring the Cronbach's Alpha has presented in Table 6.2.

Table 6.2: Thumb rule for measuring the Cronbach's Alpha

Cronbach's Alpha (α)	Internal Consistency
Alpha (α) ≥ 0.9	Excellent Reliability
0.8≤Alpha (α)≥0.9	Good Reliability
0.7≤Alpha (α)≥0.8	Acceptable Reliability
0.6≤Alpha (α)≥0.7	Questionable Reliability
0.5≤Alpha (α)≥0.6	Poor Reliability
Alpha (α) < 0.5	Unacceptable Reliability

A high value of Cronbach's alpha i.e., more than 0.9 indicates that there is a great internal consistency among the items of a scale (Streiner, 2003)[20]. Though, the Cronbach's alpha is more than 0.6 should be considered as acceptable in exploratory research suggested by Hair et al., (2006).

6.7: Statistical Tools for Data Analysis

6.7.1: Chi-square Test

Chi-squares are used to identify any statistically significant difference among the categories/sub-groups of each enterprise variable under the study exists or not. An Enterprise variable consists of nature of the enterprise, nature of ownership, year of obtaining loan, etc.

6.7.2: Cramer's V Test

[20] **Streiner, D. L. (2003).** Being inconsistent about consistency: When coefficient alpha does and doesn't matter. *Journal of personality assessment*, *80*(3), 217-222.

Cramer's V tests are used to measure the degree of association into the response between the types of enterprise and the enterprise variable under consideration.

6.7.3: Correlation Coefficient

Correlation Analysis studies the relation between two or more variables. In this study, the correlation coefficient is used to assess the multicollinearity among the various dimensions of Utility of PSBs' loan. Correlation is involved to find the relation between the factors of Utility of PSBs' Loan to the Financial Performance of MSMEs. Similarly, it is used to find the relation between the factors of Utility of PSBs' Loan to the Capital Formation in the enterprise. Further, it is used to establish the relationship between satisfaction on Quantum of PSBs' Loan and Financial Performance.

6.7.4: Factor Analysis

Factor analysis is a multivariate statistical technique which is used to find out something more elemental among a set of observed items or variables in a research study. It allows the researchers to group the measured variables into the factors or constructs. In the present study, the variables related to PSBs' loan fund services which help to reduce the finance gap in the MSMEs sector are grouped into five factors using Exploratory Factor Analysis (EFA). In factor analysis, there are several methods used to extract factors. Hence, Maximum Likelihood extraction method with the Kaiser's Criterion is used to extract the factors. For Structural Equation Model, Confirmatory Factor Analysis (CFA) is used to confirm the factors. The Confirmatory Factor Analysis (CFA) also helps to validate the convergent validity and divergent validity.

6.7.5: Regression Analysis

Regression Analysis analyzes the relation between one dependent variable and one or more than one independent variable. Regression analysis is applied three times to achieve the three respective objectives of this study. First, it is applied to examine the influences of factors of Utility of PSBs' loan towards the Financial Performance of MSMEs sector. Second, it is applied to explore the powers of factors of Utility of PSBs' loan towards the Capital Formation in the MSMEs sector. Third, it is also used to find out the relationship between satisfaction on Quantum of PSBs' loan among the entrepreneurs and in the Financial Performance of their respective enterprise.

6.7.6: Structural Equation Model

The Structural Equation Model is a term for a big set of techniques which is based on the linear regression model. It is concerned with how constructs or factors are associated with each other and is used for hypotheses testing. First, the model validity is established for the structural equation model and overall fit assessed. Then, the hypotheses are tested which are developed for the hypothesized model.

6.7.7: Path Analysis

The direct effect of each of the explanatory variables on the dependent variable and the indirect effect of each explanatory variable on the dependent variable through other explanatory variables are furnished through path analysis.