CHAPTER 3

RESEARCH MATHODOLOGY
3. **RESEARCH METHODOLOGY**

A research methodology is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, the research methodology is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data.

3.1 **RESEARCH DESIGN**

The study was empirical in nature and field survey method was used to complete the study. Empirical research relies on experience or observation alone, often without due regard for system and theory. It is data based research coming up with conclusions which are capable of being verified by observation or experiment. In empirical research the researcher must first provide himself with a working hypothesis or guess as to the probable results. He then works to get enough facts (data) to prove or disprove his hypothesis.

The aim of the study design was to ensure that accurate empirical evidence was to be obtained that can be interpreted to determine if the research propositions, set for this study could confidently be accepted or rejected. In order to test the propositions, a mainly quantitative research approach was employed by using multiple measures. Therefore, to investigate the relationships between the various variables, the research approach took the form of an empirical quantitative design. For the purpose of the study a correlative descriptive research design was used.
The methodological approach to this study was essentially empirical in nature, specifically making use of survey data collection method, that is, questionnaires was distributed to all the respondents. Due to the nature of the study, bi-variate and multivariate correlation procedures were employed.

3.2 SAMPLE DESIGN

3.2.1 Participants

The study was conducted in the SME’s of Gwalior Chambal Region. The organizations included only private sectors. The organizations mainly included they were producing plastics products, edible oil and etc. The research sample included 420 SME’s selected from different private organizations, of different places of Gwalior Chambal region. Initially a list of SME’s was collected from DIC of Gwalior, Malnpur, Banmor, Mourena and Shivpuri then researcher visited personally to 600 SME’s of the above mentioned areas out which 436 give the response to the questionnaire. Out of which 420 usable questionnaires were finally considered for further use. Hence, a response rate of 72.8% was achieved, which is well in the limits. Babbie (1998) proposed that a response rate of 50% is adequate, a response rate of 60% is good and a response rate of 70% is considered to be very good. A low response rate is not acceptable as the results cannot be generalized (Roth and BeVier, 1998). This leads to concern regarding external validity of the study.

3.2.2 Sample Size

If the confidence in the results is to be increased, it would be better to have larger
sample size. That is, if the researcher has generated items and is looking to conduct a developmental study to check the validity and reliability of the items, then it would be better to have the larger sample of respondents administered to the items (Hinkin and Schriesheim, 1989; Kerlinger and Lee, 2000). The larger the sample, the more likely the results will be statistically significant. When conducting factor analysis of the items to test the underlying structure of the construct, the results may be susceptible to sample size effects (Hinkin, 1995). Rummel (1970) recommends an item-to-response ratio range of 1:4, and Schwab (1980) recommends a ratio of 1:10. For example, if a researcher has 20 items s/he is analysing, then the sample size should be anywhere from 80 to 200 respondents. New research in this area has found that a sample size of 150 respondents should be adequate to obtain an accurate exploratory factor analysis solution given that the internal consistency reliability is reasonably strong (Guadagnoli and Velicer, 1988). An exploratory factor analysis is when there is no a priori conceptualisation of the construct (Alexander and Nunnally, 1972). For the purpose of this study a sample of 420 SME’s was considered, hence showing a ratio range of almost 1:10.

3.2.3 Sampling Technique

For the purpose of this study non-probability (Judgmental) purposive sampling technique was used. Initially SME’s were identified and then responses from all the SME’s owners or manager were taken. To ensure the participation of all the SME’s owners or manager a judgmental approach was used to choose the SME’s.

3.3 DATA COLLECTION DESIGN
3.3.1 The Measure

Kozlowski and Klein (2000) discussed the need for researchers to clearly delineate the level of theory and the level of measurement in their research. The level of theory was SME’s of different location of Gwalior and Chambal region and for measurement purpose standardized questionnaires were used. The measures were prepared on the basis of available standardized questionnaires. For developing the measure arbitrary scaling method was used. The reliability and validity of the questionnaires was checked to standardize them. The responses for the all the three measures were obtained on a 1 to 5 Likert-type scale. Likert scales are most commonly used to measure the magnitude of beliefs, attitudes, and intentions in behavioural research, and consequently a Likert scale was chosen for the composite questionnaire. According to Schepers (1992) the metric properties of items are best maintained by using a five-point measuring scale. A 5- point scale allows for a good range of scores and potentially enhances reliability (Gorsuch, 1997). Also, the midpoint option (3 = “Unsure/Undecided”) allowed for the respondent to remain neutral. Hence, Likert-type 5 point scales were used to measure all the variables where, 1 stands for “Minimum Agreement” and 5 stands for “Maximum Agreement.” The questionnaire contains four parts; part 1 was for demographics, part 2 was for reverse logistics capabilities, part 3 was for value and part 4 was for claiming back strategies.

3.3.1.1 Reverse Logistics Capabilities Questionnaire (RLC)

This variable measured using 25-item scale, to measure reverse logistics capabilities scale was developed on the basis of scale developed by many authors (Eric, Thomas
and Lauren 2010; Ho, Choy, Lam and Wong 2012; Daugherty, Myers and Richey 2002). The measure was developed using arbitrary approach.

### 3.3.1.2 Value Questionnaire

The measure included 5-items; to measure value scale was developed on the basis of scale developed by authors (Jack, Powers and Skinner 2009).

### 3.3.1.3 Claiming Back Strategies (CBS)

This variable was measured by using 12-items. To measure claiming back strategies scale was developed on the basis of scale developed by (Patricia, Chad and Alexander 2001).

### 3.4 DATA ANALYSIS TOOLS

Firstly, various tests were applied on measurement tools. To standardize measurement tools reliability of the scales was assessed through Cronbach’s alpha. Questionnaires were also validated by using different tools. Validity was checked through face validity, convergent validity and discriminant validity test was applied to check the validity of the questionnaire. Exploratory Factor analysis was also applied to identify the factors underlying reverse logistics capabilities, value and claiming back strategies, Confirmatory factor analysis was applied using AMOS to confirm the factors which was identified by Exploratory Factor analysis, to develop the model of reverse logistics capabilities, value and claiming back strategies and to check the convergent validity and discriminant validity of the variables. Structural equation
Modeling was applied using AMOS to test the proposed model and to test the null hypothesis no 1, 2 and 3. KRUSKAL-WALLIS ‘H’ test was applied to evaluate the mean difference of the firm running since from towards reverse logistics capabilities, value and claiming back strategies and to test the null hypothesis no 4, 5 and 6.