

CHAPTER 5

RESEARCH METHODOLOGY

This chapter delineates the study undertaken to develop a framework for retail competition in the Indian Power Sector. In the previous chapter, the researcher has described the research perspective through the structured literature review using thematic analysis. While the theoretical perspective is discussed with the theory of mixed oligopoly, which has its roots in oligopoly theory. The funnel approach is used to consolidate research gap in chapter four to derive research problem, research question, and research objective. The literature review conducted in chapter four was found consistent with the qualitative design described in Creswell (1994) and adopted in Miller (2009). This chapter elaborates on the undertaken research method and design. The operating definitions for the present study are also included in this chapter along with the details of data collection tools and their validation. The chapter concludes with the research process flow chart.

5.1 INTRODUCTION

This research uses a qualitative paradigm to develop a conceptual framework for the introduction of retail competition in Indian Power Sector. The researchers who worked on developing the framework uses qualitative methods (Labuschagne et al. 2005; Lipošcak et al. 2006; Zhou et al. 2007). The qualitative researchers think conceptually-via an examination of the empirical and methodological qualitative literature (Vygotsky 1934). Throughout the qualitative literature, the term "concept" has been used to refer to anything from a base-level understanding of how the data fit together to the product of analysis. Vygotsky in 1986 however, used the term more narrowly to refer to an abstract, decontextualized understanding of an object or idea. All data were analyzed using the framework approach to conceptual qualitative data analysis under investigation in this study. The results demonstrated a process of shifting from existing concepts to entering into a framework, engaging in an interview on a protocol developed from conceptual lens during analysis, and producing conceptual framework. The final protocol is developed from conceptual framework and discussion with experts. Taken together, these results yield a framework for

introducing retail competition in Indian Power Sector. Research has suggested that incongruities were noted in the literature (conceptualization) and participants' experiences (during interview) specifically while analyzing qualitative data. According to the article entitled, “Methodological Considerations in Qualitative Research” to minimize the incongruities in qualitative data analysis the qualitative research must describe following areas of methodology - the role of the researcher, different strategies, data collection techniques, and data analysis (Stainback and Stainback, 1984). The researcher has maintained accountability throughout the research process using Lincoln and Guba (1986) comprehensive list of criteria for evaluating the quality of qualitative research. This list is widely adopted and expanded upon by Kvale (1995), Seale (1999, 2002) and Mertens (2005). These criteria are – dependability, confirmability, transferability, creditability, authenticity, and crystallization (Lincoln and Guba, 2000). Table 5.1 below represents few relevant qualitative studies undertaken in the area of power sector.

Table 5.1: Relevant Studies in Power Sector Using Qualitative Data Analysis

| S. No. | Author | Year | Dimensions |
|--------|------------------|------|--|
| 1 | Finnveden et al. | 2002 | Developing framework for the integration of some analytical tools in the SEA process. |
| 2 | Rogge et al. | 2011 | Impact of European Emission Trading System (EU ETS) as the core climate policy instrument of the European Union on innovation. |
| 3 | Sovacool et al. | 2011 | Developing framework for analyzing the performance of national energy security policies. |
| 4 | Jamasb et al. | 2011 | Effect of the reforms on patents in U.K electricity sector. |
| 5 | Grubler | 2012 | Reviewed Energy transition researches in terms of theories. |

Source: Compiled by the Researcher

5.2 RESEARCH DESIGN AND METHOD

According to Leedy and Ormord, 2010 in their book entitled, “Practical Research Planning and Design” - Researchers should ideate the research design and research method in a way which enables him in gathering and processing the data as per research problem. Taking up the research design and method as per research question is less or more appropriate (Leedy and Ormord,2010).

The purpose of research is to "learn what has never been known before; to ask a significant question for which no conclusive answer has been found and, through the medium of relevant facts and their interpretation, to attempt to find the answer to that question" (Leedy, 1997). In a qualitative research approach, knowledge is developed based on the enquiry by choosing either of constructivist perspectives or participatory perspectives. The approach uses strategies like case studies, grounded theory, framework analysis etc. as the inquiry strategies (Creswell, 2003).

5.2.1 Research Design

A research design describes a framework, compositional approaches and associated process to conduct a similar study (Creswell, 1994). A research design used to answer the question sets out by the research question (Closs and Cheater 1999). The 'association' between research question and research design strengthens the entire foundation of research (Draper, 2004). Identification of research question in Chapter IV led to use the '**Qualitative Research Design**' for this particular research.

Designing a qualitative research is a complex and challenging task. The qualitative research design is the collection of both a philosophy and a collection of methods and techniques (Ferguson, 1993). A qualitative research design explores complex situations and enhance understanding (Leedy and Ormrod, 2010; Creswell, 2014). A qualitative research design encompasses research paradigms, methods and approaches (Borland, 2001). Qualitative research design for this particular research is grounded on the number of dissertations or thesis that either written for qualitative research or contain qualitative design content (Gall et al (1996); Leedy (1997); Strauss and Corbin (1998); McMillan and Schumacher (2001), Huberman and Miles (2002), Denzin and Lincoln (2005)).

5.2.2 Research Method

The purpose of this research is to develop a framework for the introduction of retail competition in Indian power sector through bifurcation of carriage and content business. Leedy and Ormrod (2010) lead the researcher to take qualitative methods based on his research question, "What should be a framework for bifurcation of carriage and content to introduce retail in Indian power sector?" Since this is maiden attempt and there is no prior framework available on introducing

retail completion in Indian Power Sector. Thus, there is a need for the conceptual base on which a framework can be built. The qualitative research sources for conceptual development include Vygotsky (1934,1986) and Cutcliffe et al. (2006). Guba and Lincoln (2005) criteria are referred for the validity and reliability of the present qualitative work. The '**Framework Methodology**' to data analysis is obtained from Ritchie and Spencer (1994) expanded and adapted by Smith and Firth (2011). Framework analysis is considered as the most appropriate qualitative method which is being used for applied policy research (Srivastava and Thomson, 2009).

5.2.3 Operating Definition

Operating definitions are made before the data collection begins. Operating definitions help to everyone in developing the same understanding about the study. Sometimes, people may differ in their views about the understating of different systems and procedures. Hence, operating definitions are necessary to bring everyone on same platform. The same eliminates ambiguity in thoughts (PQS, 2016). Therefore, the researcher defines clear and detailed operational definitions pertaining to this particular study as follows:

- 1) **Distribution Company (DISCOM):** All the power distribution companies which are operating in India. A power distribution company in India manages whole distribution System i.e. the structure of wires and associated facilities between the transmission system and delivery point of the consumer.
- 2) **Carriage and Content in Power Distribution:** Carriage is the physical distribution network through which electricity flows from one point to another for the end use and Content means the electricity which comes through distribution channel for our end use. Carriage business is also known as network business and content business is also termed as the content business.
- 3) **Separation of Carriage and Content in Power Distribution:** Separation of carriage and content means the bifurcation of present nature of distribution business into two separate businesses – carriage (network) business and content (supply) business.

- 4) **Retail Competition:** If there are more than one electricity supplier in an area who supply electricity to end consumer through common distribution network and consumer has freedom to switch the supplier, retail competition exists in such market.
- 5) **Framework:** A framework is a blueprint which is developed in the study in methodological way to separate carriage and content business of distribution sector in order to introduce retail competition in Indian Power Sector.

5.2.4 Population and Sampling

An area of inquiry constitutes a ‘population’ or ‘universe’ for the items under consideration. When complete enumeration of all the items is performed, it is known as ‘census inquiry’. Such type of inquiry results in highest accuracy. In practice, it is not possible to cover the whole population. Hence researchers quite often select some items for the study. The group of such selected items is known as sample (Kothari, 2004).

This particular research selects the United Kingdom and New Zealand as sample countries for the purpose of developing conceptualized framework to introduce retail completion in India. The base of selection was the ‘Global Competitive Metrics for Retail Markets’ as presented by Sioshansi in 2005. In the metrics, ranking of United Kingdom and New Zealand retail markets is higher than other countries as presented in Chapter III.

Since this particular research talks about separation of carriage and content from existing distribution companies in India, hence for the purpose of interview; researcher targets experienced power sector professionals who have 30+ years of experience and had witnessed the separation of State Electricity Boards. The researcher targets professionals majorly from Distribution Companies and Regulatory Commissions whereas the sectorial professionals from Generation Companies, Transmission Companies and Regulatory Commission are also considered. The size of sample for the interview purpose depends on the saturation of information.

5.2.5 Vygotsky’s Theory of Conceptual Development

Conceptual framework is a written or visual product, explained through graphs, maps or network diagrams (Miles and Huberman, 1994). Conceptual framework is a network of linked concepts

that provide a comprehensive understanding of a phenomena (Jabareen, 2009). The conceptual framework is constructed not founded. It is constructed through various piece of information borrowed from earlier experiences. But the structure and coherence wise, it is something that a researcher builds – not that already existed (Sage, 1994). The conceptual framework is primarily an idea of what you plan to study and investigate. It identifies potential validity threats to your conclusions and thus helps in refining goals (Maxwell, 2006).

The concept of Conceptual Framework is rooted in Vygotsky's sociocultural theory (Springer, 2015). Vygotsky (1986) theory of concept formation is a powerful tool to develop conceptual framework (Berger, 2005). Conceptual maps popularly known as conceptual lens are being used for developing conceptual framework (Novak and Gowin, 1984). A conceptual lens is a visual display of key thoughts grasped from historical developments (Strauss (1987). Conceptual lens usually requires considerable reworking to get them to the point where they are most helpful for the research (Sage 1994). Keeping this in mind, in this particular research the conceptual lens has been brushed up twice to support the development of conceptual framework. The approach of conceptual lens development is based on Vygotsky (1934,1986) Theory as adopted from the PhD thesis of Saskatchewan, 2010.

Vygotsky (1934,1986) presented three main classifications of pre – conceptual thoughts i) formation of syncretic groups, ii) grouping according to complexes, and iii) creation of potential concepts. This classification bore similarity with open, axial, and selective coding of thoughts respectively, suggested by Strauss and Corbin in 1998.

5.2.5.1 Syncretic Groups and Open Coding

Syncretic groups are most basic form of the preconception groupings based on vague, un-defined similarities between objects. Syncretic group are identified by Vygotsky delineates the more or less random grouping of the objects (Vygotsky 1934,1986). Under Syncretic groups and open coding, initial groups of data are created by researcher on the basis of initial impression on data to fit it together coherently. Usually, Qualitative researchers go through their own procedures to generate open codes, particularly during the early stage of analysis of original data sources (e.g.,

historical documents, audios, videos, interviews etc.). Researcher break the huge amount of available data into small units of data to create open codes (Strauss and Corbin, 1998).

5.2.5.2 Complexes and Axial Coding

Grouping of objects according to complexes is the second classification of the pre-conceptual thoughts. The complexes are more structured and concrete than syncretic groups. In this classification, the objects may be grouped according to the shared property, whether physical or analytical in nature. Complexes are most diverse form of pre-conceptual reasoning as at this stage attributes of objects are tied with them and can not be separated (Vygotsky 1934,1986). Like complexes, Axial coding involves continual linking of different data categories that emerged from open coding. The researcher revisits the data and associated category and refine them through establishing linkages. The researcher shifts his focus from one piece of data to the categories data (Strauss and Corbin, 1998).

5.2.5.3 Potential Concepts and Selective Coding

Potential concepts are final classification of pre-conceptual thinking. Potential concepts are the predecessor to conceptual thought. These are characterized by the measure of synthesis which is absent in earlier two classifications of pre-conceptual thought. In the potential concepts, objects are grouped on the basis of maximal similarity. A single attribute is recognized to make nucleus of group (Vygotsky 1934,1986). Selective coding also involves synthesis of ideas arising from original data. Maximal similar groups are similar to the sub themes which are derived from extensive data analysis took place during open coding and axial coding. Creation of nucleus of groups is similar to the "core category" developed through merging of themes (Strauss and Corbin, 1998).

This particular research performs the coding exercise in Qualitative Data Analysis Software 'Atlas.ti'. Based on the identified codes and associations between them, categories and themes are developed and refined to reach at the core concept of conceptual framework. Appendix E may be referred for the coding operations.

5.2.6 FRAMEWORK APPROACH TO DATA ANALYSIS

Since last two decades, a notable growth has been observed in the use of qualitative research methods in the area of applied policy research (Richie and Spencer, 1994). Framework Analysis developed by the Jane Ritchie and Liz Spencer in 1994; is considered as the most appropriate qualitative research method for the applied policy research (Srivastava and Thomson, 2009). The framework analysis can be undertaken both during data collection and after data collection (Ritchie et al. 2003). Framework Analysis is subset of the thematic analysis popularly known as qualitative content analysis (Bridgelal et al. 2008). The analysis identifies commonalities and differences in the data to establish the relationship between various data sets. The framework analysis provides clear track to move data from original data source to transcripts to categories and subsequently to themes (Furber et al, 2009). The analysis draws descriptive and explanatory accounts around a number of themes. Through the Framework Analysis, researcher systematically reduces and summarizes the data through matrix like structure of rows (cases), columns (codes) and cells (summarized data) (Gale et al, 2013). Framework Analysis provides straight forward transparent results and offers conclusions which can be linked back to the original data (Ward et al, 2013). This results into the constant refinement of categories and themes which lead into the development of a framework (Ritchie and Lewis 2003). Table 5.2 presents some relevant studies around Framework Analysis.

Table 5.2 Relevant Studies Around Framework Analysis

| S. No. | Author | Year | Dimensions |
|--------|-------------------|------|--|
| 1 | C Pope et al. | 2000 | To understand the role of framework analysis in applied policy research. The time scale of applied research tends to be short and there is often a need to link the analysis with qualitative finding. |
| 2 | S Sofaer | 2002 | To clear that the research questions and the use of conceptual framework to guide data collection and analysis are not considered inappropriate. |
| 3 | Y reen | 2009 | To propose a new qualitative method for building conceptual frameworks for phenomena that are linked to multidisciplinary bodies of knowledge. |
| 4 | Srivastava et al. | 2009 | To enlighten that framework analysis provides an excellent tool to assess policies and procedures from the very people that they affect. |
| 5 | J Smith | 2011 | To outline framework approach, discuss its relative merits and provide a working example of its application to data management and analysis. |
| 6 | J. Ward et al. | 2013 | To demonstrate Framework Analysis using a worked example and to illustrate how criticisms of qualitative data analysis including issues of clarity and transparency can be addressed. |
| 7 | K Gale et al. | 2013 | To discuss when it is appropriate to adopt the Framework Method, explains the procedure for using it and discusses the strengths and limitations of the approach. |
| 8 | C. Lacity et al. | 2016 | To make qualitative methods more accessible to both researchers and practitioners by providing a framework that categorizes various text analysis approaches. |

Source: Compiled by the Researcher

Application of the Framework Analysis

Framework Analysis is chosen to underpin the data analysis for some reasons. First, the framework analysis particularly suits for the cross-sectional descriptive data analysis which enables different aspects to be captured under the investigation. Second, Interpretation of researcher for experience of participants is transparent. Third, the interconnected stage of framework analysis explicitly describes the processes which guide into the systematic analysis of data for the development of descriptive and explanatory accounts (Ritchie and Lewis 2003).

5.2.6.1 Data Management

Data for hundreds of pages of different documents and hours of interviews was managed through the 'Data Management' stage. The qualitative data was mainly in the form of documents. Interviews and discussions were also converted into the written form. Important phrases of paragraphs or sentences of highly rich documents were put into the form of quotation and then summarized by developing open codes or in-vivo codes. In-vivo codes are backed within the framework analysis as a means of staying 'true' to the data (Ritchie and Lewis 2003). Preliminary thoughts were written to have the more formal ideas about the generated codes. Based on the in-vivo codes and preliminary thoughts; categories were developed. This all led in the familiarization of data. The flow of data management is illustrated in Figure 5.1 through the coding matrix of codes and categories. The coding matrix enabled the progress to be recorded and changes to be tracked.



Figure 5.1: Data Management Through Coding Matrix

Source: Smith and Firth, 2011

Identification of thematic framework

The coding matrix was developed from the selected documents and interviews conducted which represents a range of experiences. The in-vivo codes generated initially formed a potential category. These potential categories were grouped together to form broader categories. These broader categories were consecutively brought together to generate initial themes. After the derivation of initial themes, the data was sorted out based on the different levels of generality of themes.

These categories and themes were managed and organized through ‘coding indexes’. The data of coding index was revised constantly through the process of data analysis whenever a new insight emerged. Figure 5.2 below presents the columns to form a coding index:

| | |
|-----------------------|---------------------------|
| Initial themes | Initial categories |
|-----------------------|---------------------------|

Figure 5.2: Fields in a Coding Index

Source: Smith and Firth, 2011

5.2.6.2 Descriptive Accounts

Coded data was summarized and synthesized through descriptive accounts. The summarization and synthetization of diverse coded data is performed through refining categories and themes. Critical thinking about the relationship between codes was the crucial element in the refining process. Further, two linked practices were undertaken to reconcile the refining. In first practice, the data was synthesized through refining initial categories and initial themes until the whole picture emerged out. This was accomplished by continually referring back to the original data and checking meaning across the transcripts. In second practice, the abstract concepts were derived through identification of the key dimensions of synthesized data and building associations between concepts and themes. After the development of abstract concepts, the data was sorted out as per the finest sequence of themes which results into the development of core concept. Figure 5.3 below represents the moving process of the categories and themes in a coding index and establishes linkages between the categories and final themes from which the core concept was emerged out.

| | | | | |
|-----------------------|---------------------------|---------------------------|---------------------|---------------------|
| Initial themes | Initial categories | Refined categories | Final themes | Core Concept |
|-----------------------|---------------------------|---------------------------|---------------------|---------------------|

Figure 5.3: Deriving Core Concept through Establishing Links Between Categories and Themes

Source: Smith and Firth, 2011

5.2.6.3 Explanatory Accounts

Explanatory accounts reflected back in the original database as a whole and also in the analytical stages to ensure whether the beliefs and experiences of documents and interviews were presented accurately. This exercise minimized the possibilities of misinterpretation. One core concept ‘introduction of retail competition in India’ was generated through the application of framework analysis. The core concept was in line with the objective of the study for which documents were analyzed and interviews were performed. The explanatory accounts of the framework analysis involved making sense of the various concepts, categories and themes emerged out. This was accomplished through exploring the relationship between core concepts, established literature and theoretical premise related to the introduction of retail competition in Indian Power Sector through the separation of carriage and content. Once the relationships were described and concepts had been identified, typologies were emerged to explain the working of various concepts.

Figure 5.4 below presents stage wise overview of the Framework Analysis used for this particular research. Appendix G may be referred for the coding operations performed.

| Stages | | | |
|-----------|--|--|--|
| | Data management | Descriptive accounts | Explanatory accounts |
| Processes | <ul style="list-style-type: none"> • Becoming familiar with the data (reading and re-reading) • Identifying initial themes/ categories • Developing a coding index • Assigning data to the themes and categories in the coding index | <ul style="list-style-type: none"> • Summarising and synthesising the range and diversity of coded data by refining initial themes and categories • Identify association between the themes until the ‘whole picture’ emerges • Developing more abstract concepts | <ul style="list-style-type: none"> • Developing associations/ patterns within concepts and themes • Reflecting back on the original data and analytical stages in order to ensure participant accounts are accurately presented thereby reducing the possibility of misinterpretation • Interpreting and explaining the concepts and themes • Seeking wider application of concepts and themes |
| | | | |

Figure 5.4: Process of Framework Analysis

Source: Smith and Firth, 2011

5.3 DATA COLLECTION INSTRUMENT

Qualitative interviews are powerful and flexible tool for capturing data. These are generally uses to convey messages, views and findings concerning a research topic. Protocol formation for the interview depends on the type of interview selected as per the need of the study. In this particular study, open ended questions were designed to conduct the semi –structured interviews. The stage wise consideration for to design the protocol under the semi – structured interviews was as follows:

1. **Selection of Semi – Structured Interviews:** Basically, interview questions belongs to 3 categories i.e. Structured Interviews, Unstructured Interviews and Semi – Structured Interviews. In structured interviews, usually similar questions are asked from each and every respondent. Variation in questions does not occur. On the other hand, unstructured interviews are informal and do not have pre –determined bunch of questions. In unstructured interviews, a broad and holistic conversation occurs between the interviewer and respondent. Whereas, semi-structured interview uses the balanced approach, in between the unstructured and structured interviews. In this type of interviews, such environment is developed where the discussion may happen in detail. The interviewer helps the respondent to drag into the area of research. This helps in gathering of more detailed information having higher degree of depth. Semi structured interviews also helps in narrowing down the areas around topic of research. A completely unstructured interview may get deviate from the theme of research.
2. **Crafting the Protocol:** This stage is most important among all the stages. An interview protocol has two main components: i) how the interviewer introduces and establishes himself and ii) Questions to be asked on subject matter. The first component is important to create a healthy environment to receive truthful comments from the respondent. For this particular research, the interviewer incorporated the statements of confidentiality, consent for interview and options to withdraw. The interviewer also discussed the scope and use of results. The second component of drafting the questions is central theme for developing the protocol. Good grasp of subject matter is most important factor while developing the

protocol. Previous works done and existing literatures are needed to be considered while developing the protocol. For this particular research, the researcher developed the initial protocol on the basis of conceptual lenses which were based on the relevant literatures and relevant studies. Further, the draft of interview protocol has been made based on the conceptualized framework and was subsequently refined with the expert consultation of field expert and my research guides (Kvale, 2007).

3. **Conducting and Writing the Interviews:** All the interviews conducted were written down and transcripts were made. In this particular research, 7 transcripts were made for 7 respondents. These 7 transcripts resulted into 350 quotations for the 50 questions formulated for each interview.
4. **Analyzing the Interviews:** For every type of interview - a procedure is needed and framework analysis is the best way to provide a focused and repeatable procedure for data reduction. Through the framework analysis, codes were identified on the quotations and then data is reduced by developing relevant categories and themes. These themes and categories were refined in order to reach at the core concept.
5. **Presenting the Findings:** Findings were made based on identification of categories. Identification of themes and categories led to the formation of core concept. Themes identified by the researcher becomes the main stages of introducing retail competition in India while the categories became the sub steps of each individual parent stage.

5.3.1 Protocol for Conceptualised Framework

The protocol for the conceptualised framework was drafted on the basis of the conceptual lenses (developed on Indian as well as on Global Regulations) as shown in Figure 6.1 and Figure 6.2. The protocol leads in designing of conceptualized framework. This protocol consists 69 questions bifurcate into 11 categories namely: Purpose, Arm Length Rules, Overlap Threshold, Disclosure Regulations, Regulations Making Powers, Charges of Line Services, Transfer Scheme, Corporate Separation, Ownership Separation, The Electricity Code and Open Access. Each question developed under the protocol has a unique scope which is defined against the same question. Table 8.2 'Protocol for Conceptualized Framework' in Appendix H may be referred for the protocol.

5.3.2 Interview Protocol

Interview protocol for the study was developed on the basis of conceptualised framework. The protocol which led in the formation of conceptualised framework has been discussed with the industry experts. After incorporating the necessary changes, the protocol was validated (refer Appendix F) to make it final. The protocol consists of 50 questions bifurcated into 7 categories namely: Purpose, Present Scenario of DISCOMs, Transfer Scheme, Open Access, Consumer, Tariff Regulations, The Electricity Codes. Table 8.3 ‘Protocol for Interview’ in Annexure H may be referred for the interview protocol.

5.4 LIMITATIONS

Each method of research may have certain strengths and weakness. Weaknesses and differential methodological focuses of each method results into certain limitations. For this particular study, limitations which were sensed during the research are:

1. The conceptual and pre-conceptual thoughts were not shared directly with the respondents. This was a difficult decision but not doing so led to limitation of this research. However, the term concept was used during the conceptualization process.
2. Since this particular research is the first research for suggesting a framework to introduce retail competition in Indian Power Sector through the separation of carriage and content in distribution; reference theories and adopted applications are limited. This limitation results as the ability to examine the conceptual framework and associated methodology is lacking experimentation in the real world. In the other words, it can be said that the demonstration of framework was not applied in real world.
3. This research only used qualitative methodology. Combination of qualitative and quantitative research methods could have provided the richer research insights. However, mixed methods might be lengthy and might require greater amount of resources.

5.4.1 Conceptual Lens and Biases

“Conceptual lens’ of a researcher is a collection of experiences and beliefs through which a set of data is observed. Such conceptual lenses might lead in holding particular biases which are consequences to various experiences, beliefs, feelings and thoughts. Lenses and biases are not

synonym to each other. The term bias reflects the connotation of contorting the data, intentionally or unintentionally.

Throughout all the stages of this particular research, the researcher attempted to honestly assess both – conceptual lenses and biases. The major bias which the research brought in this research was the personal investment in pre-conceptualization and conceptualization phases of qualitative data analysis. However, during the research, the researcher tried to bracket his biases but not the lenses.

5.5 RELIABILITY AND VALIDITY

Qualitative research methods are being widely used in the field on applied policy research. Qualitative research uses bulk of data – text from document transcripts and interviews. Object oriented forms like audio segments, videos, visual images are also considered for this purpose. Though researchers had proposed a general guideline to analyze such data (Weber 1990; Denzin and Lincoln 1994; Carey et al. 1996; Ryan and Bernard 2003); most articles only address definite queries of methodological importance (Carey et al. 1996; MacQueen, et al. 1998).

A research is reliable if results are accurate representation of population and if they are consistent over time. A reliable research reproduces same results under the same methodology (Joppe, 2000). The result of a qualitative research is based on the generated codes. Inter-coder reliability needs to be there if in-vivo codes are being generated from open ended data (Hauschka et al, 2004). In this particular research, Framework Analysis approach of qualitative data analysis; identified the codes and generated relevant categories and themes which appeared in text passages or in other media segment. The researcher compiled the codebook with list of defined codes which were aligned with the respective theme. Then to check the reliability, the researcher judged each pre-determined text segment to see whether a specific code was present or not. This procedure of inter-coder reliability assessed the degree to which coders may agree to generated codes (Mays and Pope, 2000).

Validity determines that the research truly measures what was intended to measure and whether the results are truthful or not. In other words, a research is valid if the research instrument is

fulfilling the research objective (Joppe, 2000). Many researchers had developed their own concepts to check validity in the qualitative research (Lincoln and Guba, 1986; Seale, 1999; Stenbacka, 2001; Davies and Dodd, 2002). The choice to select the procedure for validity test is governed by two perspectives – i) the lens researcher selects to validate the research, ii) paradigm assumptions of researcher (Creswell and Miller, 2000). Procedure to check validity includes the strategies which researcher uses to check the credibility. Validity does not refer to data but the inference drawn from the processing of data (Hammersley and Atkinson, 1983).

When the researcher refers to the lens in research, it means that he uses a viewpoint for establishing the validity. Qualitative researchers bring a different lens towards the validity than they brought to traditional quantitative studies. Though the lens provided by researcher is their own or may belong to study participants. Hence it may not be the only perspective to make choice to validity procedure. Paradigm assumptions of researcher and worldviews may also govern the selection of procedure (Guba and Lincoln, 1994).

For this particular research ‘Triangulation’ validity procedure was used with in qualitative lens and paradigm assumptions. Through the triangulation, the researcher searched the convergence among multiple and various sources of information (documents and interviews) to form the relevant categories and themes in the study. As a validity procedure, the researcher undertook triangulation by employing researcher lens. Systematic process was adopted and data was sorted out through finding common categories and themes by eliminating the overlapped areas. The research performed through this approach is valid because the procedure relies on multiple forms of data rather than a single evidence (Denzin, 1978)

Trustworthiness of the qualitative researcher is generally questioned by positivists. It may be because the concepts of reliability and validity could not be addressed in the same way as often researchers address in quantitative research. However, many investigators use different notations to distance themselves from positivist thinking. Lincoln and Guba, 2000 proposed following criteria to be considered in pursuit of a trustworthy research. These criteria are: i) credibility (in preference to internal validity), ii) transferability (in preference to external validity), iii)

dependability (in preference to reliability), iv) confirmability (in preference to objectivity), and v) Authenticity (presentation of beliefs). Application of these criteria in this research is as below:

5.5.1 Credibility - Credibility links to the internal validity. Ensuring credibility is an important factor to establish trustworthiness (Lincoln and Guba, 1986). The credibility finds whether the congruent are the findings with reality or not. In this particular research, following provisions were adopted to ensure the credibility: a) correct operational measures were chosen and concepts were studied to choose the well-established research method (Yin, 1994). b) ‘prolonged engagement’ was made with the documents and participating organizations (Lincoln and Guba, 1990 and Erlandson et al, 1993) before the first data collection. This helped in early familiarization with the culture of participating organizations. c) Triangulation: Viewpoints and experiences of individuals were verified against others which resulted into rich content of needs, behaviors and attitudes. Diversity in the range of documents was also employed as the source material.

5.5.2 Transferability - Transferability links to the external validity. Transferability measures the extent to which the findings to a research can be applied in other circumstance (Merriam,1988). It is the responsibility of a researcher to ensure the quality fieldwork to enable the transfer of findings. (Firestone, 1993). A researcher needs to define that how far he is confident in transferring the results and conclusions. As per Shenton, 2004; following factors affects the transferability: a) number of participating organizations b) location of participating organizations c) data collection method d) number of sessions for data collection e) time period for data collection. For this particular research, to ensure the transferability, the researcher considered all the three main segments of Indian Power Sector i.e. Power Generation, Power Transmission, Power Distribution for data collection. Regulatory Bodies at State and Central level were also interviewed with the officials of other three segments. Interviews were conducted in five sessions for five participants. Location of participating organization was the State of Delhi and Uttarakhand. Since the power sector structure in India is common across the nation, results are transferrable and applicable throughout the nation.

5.5.3 Dependability - Dependability addresses the issue of reliability. Dependability shows whether the similar results from the same research would be found or not if the same method and

same participants are being used in the same context (Marshall and Rossman, 1999). In this particular research, to address the dependability directly, the methods and processes adopted in the study were reported in detail so to enable a future investigator to repeat the work. A proper research design had been laid down and in-depth coverage of adopted research methodology was described which allows a reader to assess whether a proper research practice had been followed or not. The same developed the understanding in the mind of a reader regarding a) research design, research method and its implementation b) methods of data gathering c) reflective analysis of the research output with the evaluation of its effectiveness.

5.5.4 Confirmability - Confirmability links with the objectivity of research with the use of tools that are independent on human skills and perceptions (Patton, 2005). Necessary steps need to be taken by the researchers to ensure that the findings of work are results of various experiences and ideas of participants; not of the preferences and characteristics of the researcher. Since the questionnaires are designed and research method is selected by the researcher himself, an inevitable bias may remain there. In this particular research, to ensure the confirmability, the questionnaire was discussed with the field experts and research guides before the finalization. In regard to the selection of research method, the reason for selecting the framework analysis over other qualitative methods was explained in very well manner.

5.5.5 Authenticity - Authenticity refers to the balanced presentation of various beliefs, values and perspectives (Mertens, 2005). Authenticity in a research is assessed through i) fairness, catalytic authenticity and ontological authenticity (Lincoln and Guba, 2000). For this particular research, the researcher was fair in the representation of participants' thoughts, words and experiences. Researcher ensured the fairness in analyzing the data by actively assessing his own biases. Interpretation of the data was shaped by the conceptual lenses and the same was also found as the fair representation of participants' experiences. Ontological authenticity was maintained as the several participants and stakeholders of power sector reflected the willingness to read this thesis and hoped that this research will open up the door of retail competition in India. Catalytic authenticity for this research was maintained as the researcher has published two research papers from this work in high impact journals. The work was also presented in various conferences.

5.6 ETHICAL RESEARCH

A research may have ethical issues. The research process may also create pressure between the rights of participants for maintaining privacy and aim of research to make it generalized for the benefit of others. Ethics in a research pertains with doing good for the society and avoiding harm for anyone. Such harm can be prevented by applying appropriate ethical principles. The protection of human participants in any research is imperative.

Role of Researcher

Usually, qualitative researchers pursue close and personal contacts with the participants. Hence under such privileged circumstances, responsibilities and ethical considerations for researches increases. As per Dobbert (1982), following four ethical considerations should be considered by researcher while doing the research: i) confidentiality ii) honesty iii) responsibility iv) fair return.

In this particular research, the confidentiality was ensured by protecting identity of participants (Whitt, 1991). Names of participants were not disclosed with the interview transcripts, however their designation, organization and experience had been mentioned. Though the researcher discloses the information gathered around protocol, general discussion around the health of Indian Power Sector is also protected by not disclosing it. Honestly was maintained as participants of this study had all information about the purpose of this research. Methodology, use of information and results were also discussed with them (Dobbert, 1982). The information was shared with the participants before interviewing them.

The researcher took all the responsible steps to act in an ethical and professional manner during the research. The researcher assumed that how this research may affect the participants and hence he took all the necessary steps to lessen the negative outcomes. This behavior ensured a responsible researcher within the investigator. Fair return for the participants of this study was ensured by compensating them with the results of this study in published form. Copies of report were sent to all participants (Fetterman, 1989).

Interview

Qualitative research interviews gain access to the feelings, experiences and social environment of participants. The qualitative interviews produce data which is useful to fulfil the objective set out by research question. However, types of interviewed and involved processes are determined by the research design of the study (Robinson and Thorne, 1988).

In this particular research, the researcher conducted semi-structured interviews to facilitate the focused exploration around the research objective (Fossey et al, 2002). In order to grab the authentic data from the interviewees, the researcher targeted experienced professional from power industry who had seen the unbundling of SEBs. Ethical guidelines as per the rules and regulations of various organizations had been followed by the researcher for conducting interviews. A proper consent through proper channel was taken to make the transcripts of data converted from the interaction happened during interviews.

Participants

Before the interviews, a proper appointment was taken from each of the participant. The researcher behaved in a professional manner and showed the interview transcripts to all participants after interviewing them. Participants requested not to share the interviewed data with anyone else without their consent. The data was jotted down by the interviewer during interviews and was not recorded in any form as per the recommendation of participants. Participants asked to not quote their names hence their identity was not disclosed.

Procedures

Research ethics defines the standards of conduct for researchers. For any research, it is important to protect the rights, dignity and welfare of research participants. A research should be based on ethical principles laid down by the researcher's organization and participant organization. For this particular research, the researcher followed all the necessary procedures and guidelines laid down by parent and participating institutes. All the pre-requisites and formalities were fulfilled as asked time to time by the respective offices.

5.7 RESEARCH PROCESS AND FLOW CHART

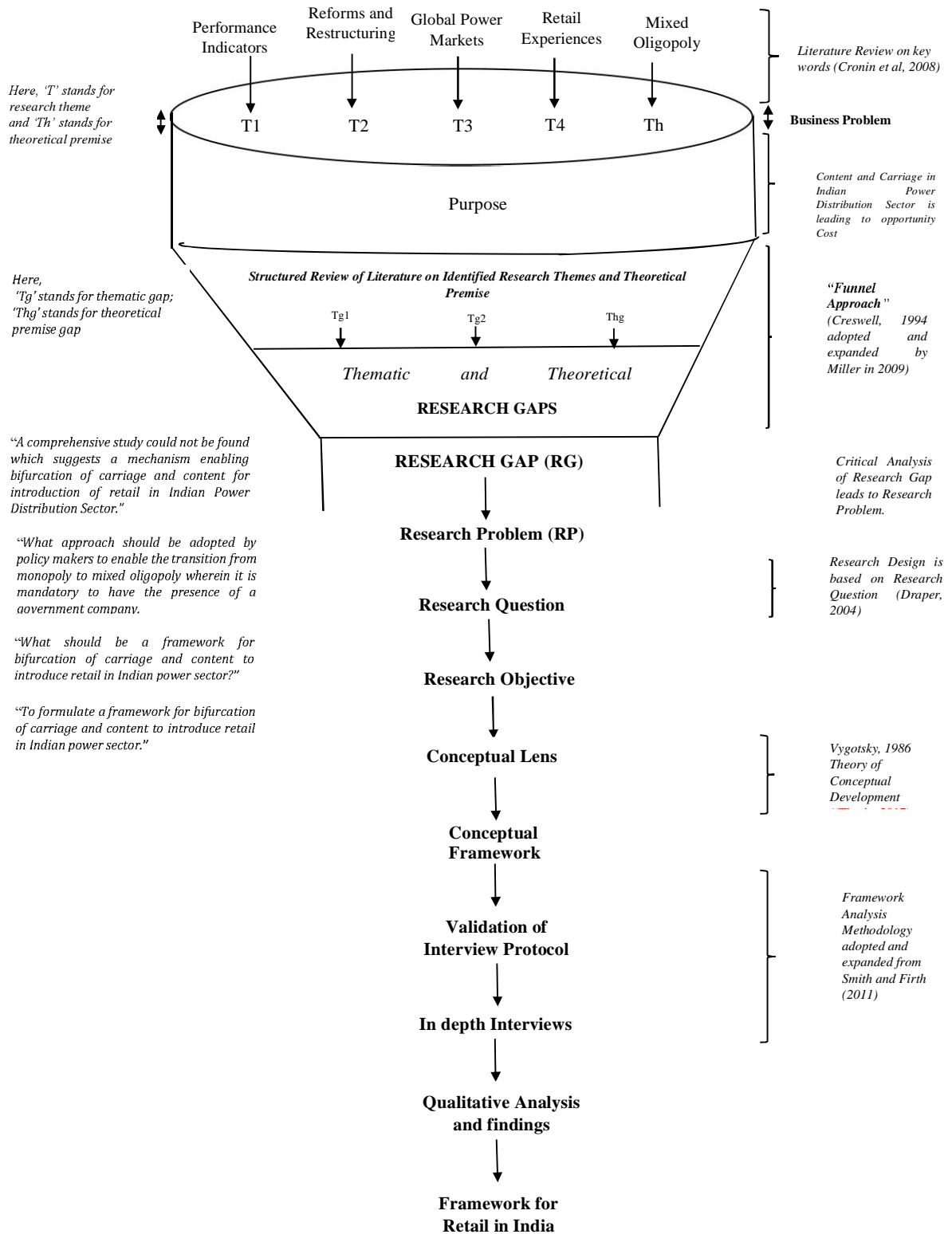


Figure 5.5: Flow Chart of Research Process

Research question derived in the previous chapter reflected the need to undertake qualitative research design. Simultaneously, the research objective suggested the need to create conceptual lens as per the ‘Theory of Conceptual Development, Vygotsky, 1986’. Separate Conceptual Lenses were constructed for Indian Retail Regulations and Global Retail Regulations. Initial protocol was formed based on the conceptual lenses. For the initial protocol, relevant answers were located into policy documents and a transcript has been prepared. Transcript was then processed as per the approach suggested by Vygotsky, 1986 and Strauss and Corbin, 1998 to get the conceptualized framework.

Draft of final protocol for the study was then designed and refined with the expert comments. Interviews were undertaken on the final protocol and transcripts made were processed in Atlas.ti using framework analysis. Coding, categories and identified themes resulted in the formation of framework to introduce retail competition in India.

5.8 SUMMARY

1. Qualitative research design was used in this research to develop a framework to introduce retail competition in Indian Power Sector.
2. On the basis of Vygotsky (1934,1986) theory of conceptualization, conceptual lenses and conceptualized framework were prepared.
3. Data collection instruments were described in the chapter. Primary protocol was developed on the basis on conceptual lens which Interview protocol was developed on the basis of Conceptualized framework.
4. Framework Methodology as adapted and expanded by Smith and Firth (2011) was used to process interview transcripts through data management, descriptive accounts and explanatory accounts.
5. Limitation of the study with conceptual lens and biases were discussed.
6. To minimize the incongruities in qualitative data analysis, ethical guidelines and role of researcher was described.
7. To check the trustworthiness of the research; following criteria were used: dependability, confirmability, transferability, creditability, authenticity whereas triangulation is used to check inter-coder reliability and validity.
8. Research process flow chart for this particular research was presented and described.