Chapter 4

RESEARCH METHODOLOGY

"Scientific Research is a systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena" (Kerlinger, 2004).

"Research is the systematic and objective identification, collection, analysis, dissemination and use of information for the purpose of assisting management in decision making related to identification and solution of problems and opportunities" (Malhotra, 2005).

4.1. Identification of Research Gap

It is clear from the previous two chapters that, in the light of the enormous financial requirements in the infrastructure sector, banks should be strengthened by research to bridge the knowledge gaps in project appraisal and in the measurement of risks in these projects.

Banks' appraisal officers, trained and for decades and practising security-backed lending, need to understand and appreciate the transformation shift from corporate finance to project finance in the financing of infrastructure projects. This change in the latter's structure demands a better appraisal methodology which also focuses on understanding of the various players involved in the project structure and the other numerous contracts and agreements. The present research provides a comprehensive and more appropriate appraisal methodology that will be drawn from across the spectrum of participating banks. Infrastructure projects being 'greenfield' in character, risk identification, analysis and mitigation factors assume real significance. More importantly, bankers need to reassess the credit rating mechanism, which is used for rating the projects, to decide the pricing of loans, asset classification and capital adequacy norms. It is a hunch that standard credit scoring models which are just an extension of models used in corporate finance, may lead to inappropriate rating, thus leading to inappropriate pricing decisions. The present research will identify the elements of risk, in the infrastructure sector in general and road and power projects in particular, and then try to verify the hunch through statistical research. This will help the banks in developing suitable rating models as they move towards Foundation IRB approach.
It is imperative that the bankers equip themselves with the requisite tools and expertise for appraising the technical feasibility, financial viability and bankability of projects, with particular reference to risk analysis. Banks are also required to ensure that the individual components of financing and returns on the project investment are well defined and accurately assessed. Lending and investment decisions in such cases should be based solely on commercial viability judgment and not based just on state guarantees (RBI Circular dated July 11, 2003) – definitely not on hunch.

“A hunch, no matter how good it may be, is at best an unproved assumption till it stands the test of empirical investigation.” Keeping this dictum in mind, the research process is established.

4.2. Research Process

4.2.1 Problem Statement: As already drawn out from literature survey, and elaborated in detail in the preceding chapters, the researcher, in order to define the problem correctly, and held discussions with bank credit analysts in project appraisal departments (Annexure 4.2) and conducted interviews across different levels of officers (Annexure 4.3). The process also involved analysis of secondary data (RBI circulars and reports) and published research articles, various industry reports and participating banks’ internal data.


4.2.1.2 Statement of the Problem: While appraising and financing projects, do Indian banks understand and differentiate between the legal and contractual structure of ‘greenfield’ infrastructure projects, with the resultant focus on project cash flows and the risks emanating thereof, vis-à-vis the traditional ‘brownfield’ projects undertaken by the corporates? Do the internal rating models used by the banks capture the entire credit risk involved?

4.3 Objectives

Development of an approach to the problem includes formulating an objective or the theoretical framework, analytical models, and hypothesis (Kumar, 2006).
4.3.1 Detailed Objectives

- To study the Financing of Infrastructure Projects with focus on project appraisal and risk measurement and to extract the best practices of Indian banks.
- To examine the existing framework for appraisal and risk measurement in Power and Road sectors.
- To develop appropriate case studies in order to capture the procedures and critical issues involved in financing infrastructure.
- To analyze and evaluate the credit rating mechanisms that banks use for measurement of risk and to statistically examine the attitude of credit officers towards relative importance of risk variables under each factor used in credit scoring in the power and road sector.
- To draw conclusions from the study on project appraisal and risk measurement practices and survey results, identify gaps and offer suggestions for improving the methods.
- To offer suggestions in order to strengthen bank financing of infrastructure sector in India.

The real rationale for focusing on road and power sectors has been explained in detail in the chapter on scope of research.

4.4 Hypothesis (HO)

Hypothesis is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher (Malhotra, 2005). Two hypotheses are offered.

4.4.1 First Hypothesis: For Project appraisal and risk analysis, hypothesis testing is related to differences between mean of two samples, that is credit officers who have appraised projects in the Road Sector and the Power Sector.

- $H_0$ = Attitude of credit officers towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in credit rating mechanism, is not different from sector to sector while appraising projects in the chosen sectors of Road and Power.
- H1 = Attitude of credit officers towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in credit rating mechanism, depends on inherent risks unique to the sector and status of the promoter.

4.4.2 Second Hypothesis: For the structural differences between corporate and project finance, hypothesis testing is related to the differences between mean of two samples – that is credit officers who have appraised projects in both the infrastructure sector and the traditional projects started by the corporate sponsor.
- HO = Banks are using 'with recourse' structure to fund Infrastructure Projects which is not different from financing corporate projects.
- H1 = Banks are using project finance structure to fund infrastructure projects with 'no or limited recourse' which is different from financing corporate projects.

4.5. Research Design

The following flowchart explains the design.

1. **Step 1** Study the project documents and appraisal notes of the participating banks.
2. **Step 2** Prepare a detailed note on Project Appraisal and Risk Measurement practices.
3. **Step 3** Examine the application of the process described above on the chosen sectors: Power and Roads, and identify the appropriate risk variables.
4. **Step 4** Prepare two case studies which would capture the process in Road and Power sectors.
   - Identify gaps in the risk variables and scores credit officers assign to them across different sectors.
5. **Step 5** Identify the above risk variables and test the perception of credit officers intra-sector on the credit rating mechanism used by banks. (This is done by conducting a survey on the officers who have appraised projects in road and power sectors.) Transition matrix of the data for five years is created for ratings done by the bank to seek rating migration and PD estimates in the above risk measurement system.
6. **Step 6** Identify gaps and suggest an alternate project appraisal and risk measurement technique which may be unique to the particular sector.
A research design is a suggestive framework or blueprint for conducting a research project. (Malhotra, 2005). It details the procedures necessary for obtaining the information needed to structure and solve research problems. The research design lays the foundation for conducting the research. Hence, a good research design will ensure the validity and substance of a research project as well. A research design is broadly classified as exploratory and conclusive. The primary objective of exploratory research is to provide insights into and understanding of the problems posed by the researcher (Haiman, 2002). Exploratory research is used in those cases when the researcher defines the problem more precisely, identifies the relevant course of action, or gains additional insights before an approach can be developed. The objective of conclusive research is to test the specific hypothesis and examine relationships. It is based on representative samples and the data is subject to quantitative analysis. The findings are conclusive in nature and therefore they are used for inputs for managerial decision making.

The research design for the present study is essentially descriptive in nature where the best practices for systematic appraisal and risk measurement are described without showing any relationship between the risk drivers. A single cross-sectional design is used in which one sample of respondents is drawn from the target population and information is obtained from this sample only once. This is followed by both qualitative and quantitative research. Qualitative research is an unstructured exploratory method based on samples that provide insights and understanding of the problem setting. To define the problem correctly, the researcher undertook qualitative research by studying the project documents and appraisal notes available in the participating banks. Initially depth interviews were conducted with heads of credit departments of the participating banks followed by interaction with the Reserve Bank of India and Ministry of Finance officers. Depth interviews were conducted with some of the leading project developers as well.

4.5.1. Descriptive Research Design: The methods that are used in the research are described below.

4.5.1.1. Observation Method: Observation is called as the recording of behavioral patterns of people, objects and events in a systematic manner in order to analyze information about the phenomenon of ‘interest’ (Amphora, 2005). The research employs the structured observation method in a natural setting as the researcher has carried out detailed content analysis (which is quantitative description of manifest content of communication) of the project’s loan files.
the participating banks. In all 50 loan files – 20 of road sector, 20 of power sector and 10 files related to projects in port, telecommunications, and renewable energy, inland container depots, and container freight stations – were studied. The survey includes scrutiny of detailed project reports by the borrower and sanction notes prepared by the bankers. The research covers only those proposals which were sanctioned prior to 2004 (2002 onwards) since follow-up and monitoring remarks between the years 2002-08 were already available in the files. This was followed up by scrutinizing the project proposals of the project developers. Thus the detailed project appraisal and risk analysis processes were drawn out. In order to substantiate the findings, case study methodology is adopted. The researcher will develop two case studies which will describe the process of project appraisal, risk analysis and measurement techniques for the selected power and road sectors.

4.5.1.2 Case Study Method: Case study is an ideal methodology when a holistic and an in-depth investigation is intended (Feagin, Orum, and Sjoberg, 1991). Whether the study is experimental or quasi-experimental, the data collection and analysis methods are known to hide some details (Stake, 1995). Case studies, on the other hand, are designed to bring out the details from the perspectives of the participants by using multiple sources of data. Yin, Stake, and others who have wide experience in this methodology have developed robust procedures. Yin (1994) has recommended four stages for case development:

1. Design the case study
2. Conduct the case study
3. Analyze the case study evidence, and
4. Draw the conclusions, give recommendations and point out the implications.

Yin (1993) has also identified some specific types of case studies:

(a) Exploratory cases are sometimes considered as a prelude to social research;
(b) Explanatory case studies may be used for doing causal investigations; and
(c) Descriptive cases require a descriptive theory to be developed before starting the project.

The present research uses descriptive case studies as a prelude to conclusive research. Balu (2002) used this methodology in a study to understand the infrastructure financing
policies of the banking system. In all the above types of case studies, there can be single-case or multiple-case applications.

Yin (1994) has identified six primary sources of evidence for case study research. The use of each of these might require different skills from the researcher. Not all sources are essential in every case study, but the importance of multiple sources of data to strengthen the reliability of the study is well established (Stake, 1995; Yin, 1994). The six sources identified by Yin are: (i) documents, (ii) archival records, (iii) interviews, (iv) direct observations, (v) participants' observations, and (vi) physical artifacts. The present research uses all the above data sources.

The unit of analysis is the project appraisal and risk measurement procedure used by the Indian banks'. Being multi-perspective analyses (Feagin, Orum, and Sjoberg, 1991), the researcher has considered not just the views and perspectives of the credit officers, but also of the project developers, engineers, legal counsels and government departments and other such relevant groups and the interactions between them. Levy (1988) used a single-case design for the study at the University of Arizona. Single cases may be used to confirm or challenge a theory, or to represent a unique or extreme case (Yin, 1994). Single-case studies are also ideal for revelatory cases where an observer may have access to a phenomenon that was previously inaccessible. These studies can be holistic or embedded, the latter occurring when the same case study involves more than one unit of analysis. Multiple-case studies follow the replication logic. The present research develops one case study each for the sectors in focus: power and roads.

As in all research, consideration must be given to construct validity, internal validity, external validity, and reliability (Yin, 1989). Levy (1988) established construct validity using the single-case exploratory design, and internal validity using the single-case explanatory design. Yin (1994) suggested using multiple sources of evidence as the way to ensure construct validity. The current research used multiple sources of evidence; survey instruments, interviews, and documents. The specification of the unit of analysis also provides the internal validity as the theories are developed. Data collection and analysis test the theories. External validity is more difficult to attain in a single-case study. Yin (1994) provided the assertion that external validity could be achieved from the theoretical relationships, and, generalizations could be made from these. It is the development of a formal case study protocol that provides the reliability that is required of all research.
Case study research excels at bringing us to the understanding of a complex issue or an object and it can extend our experience or add strength to what is already known through previous research. Case studies emphasize the detailed contextual analysis of a limited number of events or conditions and their relationships. Researchers have been using the case-study research method over the years and across a variety of disciplines.

4.5.2. Conclusive Research Design

4.5.2.1 Survey Method: A structured questionnaire was given to respondents and designed to elicit information on:

(a) Credit officers’ understanding of the structural differences between infrastructure and corporate projects while appraising the projects.

(b) Managers’ attitude towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in the credit rating mechanism.

(c) Methods of measurement of risk currently being practised at banks.

4.5.2.1.2 Questionnaire: A structured questionnaire, divided into three sections, was designed. In Section A appraising officers were asked to give their opinion on the relative importance that they give to each variable under identified elements of project appraisal such as Management quality, Market potential (including demand and pricing issues), Technical issues, Construction issues, Operations issues, Legal issues, Force majeure issues and Funding issues (including factors and critical ratios). A five-point scale (least important to most important) was used and each broad element was further divided in five risk variables which together make up the entire element. Often a similar credit scoring model with similar risk variables is used by banks to rate a particular project. The rating class to which the project belongs signifies the level of risk and the pricing.

In Section B, managers were asked questions about specific risks which affect both the sectors. The questions were based on pre-decided checklists (data collected on nominal scale).

In Section C, managers were asked questions on their appreciation of structural issues as well as creation of security in infrastructure projects. The questions were based on a five-point scale as well as details based on pre-decided checklists. Thus, both metric and non-metric data were proposed to be collected through the questionnaire (Annexure 4.1).
4.5.2.1.3 **Pre-testing:** This refers to pre-testing of the questionnaire on a small sample of 30 respondents drawn from heads of credit departments of participating banks' to identify and eliminate potential ambiguities. All aspects of the questionnaire were tested including question content, wording, sequence, form or layout, question-difficulty and instructions. The respondents are of course drawn from the same population as the survey.

Personal interviews lasting 30-45 minutes were also conducted. The interviews began with open-ended lead questions and qualifying statements/views which could identify the experience of the bank executives in appraising and financing infrastructure projects in corporate projects as well as road and power sectors. It was followed by probing questions based on the above lead questions.

Then questions regarding the method of financing and structuring and the procedure of appraisal including managerial, technical, commercial and financial appraisal were asked. The questionnaire carried sub-points under each head of appraisal and tried to establish whether the rating changes from sector to sector, and, probing questions with reference to these were put to the respondents in Section A. A 'checklist of risk buckets' was prepared, based on the observations made during the study of '30 loan files', and, executives were administered the same. For each sector, the respondent was administered a similar checklist as this would help in identifying risks inherent sector-wise (Section B).

Finally managers were also asked questions on their appreciation of structural issues as well as creation of security in infrastructure projects. The questions were based on a 5-point scale as well as questions on pre-decided checklists (Section C).

Protocol analysis and debriefing techniques were made use of. The respondents were asked about their views on the questions in the structured questionnaire and their responses were collected. Respondents were further briefed about the test at the end, and they were encouraged to voice the problems they faced in responding to questions. Their suggestions were identified and incorporated in the revised questionnaire. Responses to the dummy tables were also analyzed and changes were made for better understanding of the questionnaire.

4.5.2.1.4 **Reliability and Validity:** **Coefficient Alpha**, which is a measure of internal consistency reliability, that is the average of all possible split-half coefficients resulting from different splittings of the scale items, was 0.78. It tended to increase with the addition in the
number of scale items during the pre-testing. Since the scales were pretested on a sample size of 30, an adequately positive opinion on the content validity of the scale was found.

4.6 Measurement and Scaling

The primary scales used in the questionnaire are:

(a) **Nominal Scale**: It is a scale whose numbers serve as labels or tags for identifying and classifying data. (Malhotra, 2005). This scale was used for both identifying the respondents’ experiences in project appraisal and classifying them based on their expertise in project appraisal and in a particular sector. This contained certain other multiple choice questions.

(b) **Interval Scale**: It is a scale in which the numbers are used to rate objects such that numerically equal distances on the scale represent equal distances in the characteristics that are measured. This is used to study the perception of credit officers towards structure and scoring risk drivers.

Non-comparative scaling techniques and itemized rating scale in particular are based on sources of risk. Banks often use similar scales for scoring credit risk which is subsequently used in pricing the 5-point Likert scale. A measurement scale with a brief description of risk factors of appraisal was used. The factors that were identified earlier through descriptive research are: Management quality; Market potential including demand and supply issues; Technical issues; Construction issues; Operational issues; Legal and *Force majeure* issues; Funding issues; and critical ratios. Under each factor five distinct risk variables were identified, which, if not properly addressed, becomes sources of risk.

The credit officers were asked to rate these five sub-variable risks under each element based on their perception of the importance of the risk driver in making the project successful, thus leading to final sanction. A 5-point rating scale from ‘Least Important to Most Important’ was used. Similar risk drivers were identified by Balu, (2002) for studying the project appraisal in infrastructure finance. Deshpande (2006), Bhaskar (1999) and Nirmala (1998) have used similar risk drivers while studying projects.
4.7 Sampling Frame

4.7.1 Population: For eliciting the process of Project Appraisal and Risk Analysis, the population consists of all Indian banks, that include the 27 Nationalized Banks, 23 Other Scheduled Commercial Banks and 28 Foreign Banks and those Credit Officers who are a part of the syndicate or lead bankers to Infrastructure Financing Projects. This includes the central bank, Reserve Bank of India as it defines guidelines for financing Infrastructure.

Transition matrix is created for ratings done by the bank using CRISIL’s Risk Assessment Model (RAM) to seek rating migration in the risk measurement system. For creation of transition matrix, 1,289 projects, rated by CRISIL risk assessment model between 2004 and 2008, served as the population.

4.7.2 The Sample: The study included collection of data from 26 public sector banks, 6 other scheduled commercial banks including private banks, 4 foreign banks and 5 financial institutions and central banking institutions like the Reserve Bank of India and the National Bank for Agriculture and Rural Development (NABARD) (Annexure 4.2).

Exposure of other scheduled commercial banks (worth Rs 22,539 crore) and that of foreign banks (worth Rs. 5,755 crore) towards infrastructure is minimal on account of the size of operations. Therefore the data is drawn largely from the public sector banks.

Further, a sample of 70 credit officers out of 102 was drawn after the attitude survey (Annexure 4.3). In a similar research by Balu (2002), a sample size of 70 was taken. As infrastructure financing is a new area which has grown in prominence since 2002, officers who have handled projects independently are quite few in the Indian banking system.

Non-probability sampling technique and Quota sampling in particular were used. The control characteristics for selecting banks were that they should have had exposure to infrastructure projects in the current year and a target should have been allotted for disbursement to infrastructure sector in their loan policy document. If either of the two control characteristics was not met, the bank was not included in the sample. For selecting officers, the control characteristics were the number of years of experience in project appraisal, which was set at 10 years, and that they should have handled projects in road and power sectors apart from brownfield corporate projects. Those who have not handled projects in both the sectors were not included in the final sample.
As data is collected primarily through personal interviews, adequate sampling control was exercised. In certain instances when mail survey became unavoidable, validation was done through a follow up on phone. The response rate was more than 95 per cent.

Forty-eight projects which had achieved financial closure and where banks in the sample category have rated and financed using CRISIL RAM model were selected for creating a transition matrix. The rating migration was noted for each of the years from 2004 to 2008. Some of the projects had in fact commenced operations during this period.

4.7.3 Data Preparation: In the case of unsatisfactory responses and missing values, the researcher returned to the respondents. The data was codified using SPSS. No weights were assigned.

4.8. Statistical Techniques for Hypothesis Testing

Univariate techniques were used as there is a single measurement of each element in the sample. The data collected were both metric and non-metric as the questionnaire used both interval and nominal scales. As data for corporate and infrastructure projects as well as road and power sectors were drawn from the same group of respondents, it was considered as paired data.

4.8.1 Tabulation and Hypothesis Testing: Frequency distribution tables were made for all elements of the appraisal process with mean scores of each risk driver. Hypothesis testing was done only for the data collected on road and power sectors. Null and alternate hypotheses are described earlier. Hypothesis testing in the present research consisted of testing of differences and as the alternate hypothesis lacks direction, two-tailed tests were used.

Both parametric and non-parametric tests were conducted. For data which was measured on interval scale, parametric tests were used and for data which was measured on nominal scale, non-parametric tests were used for hypothesis testing. Parametric tests provide inferences for making statements about the means of parent population. The t-test which is used for the present research is a univariate hypothesis test using t-distribution, which is used when the standard deviation is unknown and the sample size is small. As explained earlier, since the data is paired, the researcher used paired sample t-test. A similar analysis on paired data was done by the famous L C Gupta committee research (1996) into credit decisions of managers in financial institutions. In order to compute t for paired samples, the paired
A difference risk driver called $D$ is formed and the mean and variance are calculated. The degrees of freedom are $n-1$, where $n$ is the number of pairs. The relevant formulae are:

\[ H_0 : \text{Mean} = 0 \]

\[ H_0 : \text{Mean} \neq 0 \]

\[ T_{n-1} = D - \frac{\text{Mean}}{s_d / \sqrt{n}} \]

For data which is collected on the nominal scale an important non-parametric, the Wilcoxin matched-pairs single ranks test, is conducted. This test analyses the differences between the paired observations, taking into account the ranks and the magnitude of differences. It computes the differences between the pairs of variables and the absolute differences. It sums up the positive and negative ranks. The test statistic $z$ is computed from positive and negative rank sums. Under the null hypothesis of no difference, $z$ is a standard normal variate with mean zero and variance 1 for large samples. This test corresponds to the $t$-test.

After selecting an appropriate test, a particular level of significance is selected. Type I error occurs when the sample results lead to rejection of null hypothesis which is indeed true. The probability of making Type I error is called level of significance. An intolerably high level of significance will increase Type II errors; the level of significance was therefore fixed at 5 or 0.05 per cent.

After this the test statistic was calculated and the probability was determined (critical value) using the SPSS package. If the probability associated with the observed value of test statistic was less than the level of significance, the null hypothesis is rejected and vice versa.

4.8.2. Analysis of Variance: The risk sub-variables selected under each factor of the credit scoring model, which is used for attitude surveys, should be able to distinguish the critical risk drivers for the two sectors under focus, that is: road and power. Such a distinction is possible if the values for the selected risk drivers for the two groups are separated by wide enough margins, and the reading of risk drivers in the two groups does not overlap. That is, the means of distribution for each of the risk drivers for the two sectors under focus must be far apart. The statistical test for measuring the explanatory power of risk drivers is the $F$ test. Zmijweski (1984) conducted it for univariate models in corporate expansion and modernization projects. A statistical test for examining the differences among means for two
or more populations is called as Analysis of Variances (ANOVA). Since the researcher is
doing it for each of the risk sub-variable under each factor, one-way analysis of variance will
be done.

The t-test conducted earlier in the previous section is done for each element of the credit
score sheet as identified earlier and will help the hypothesis testing. One-way ANOVA will
investigate whether any significant difference lies in each of the risk drivers under each
element of the credit scoring sheet. For example, the element in management risk is defined
by the five risk drivers: (i) Transparent shareholders’ agreement; (ii) Track record of
sponsors; (iii) Financial strength and Prudence of sponsors; (iv) Capability for equity infusion;
and (v) Viability gap funding or government grant.

If the attitude towards risk sub-variables changes significantly from sector to sector, it
will necessitate a relook at the credit appraisal and the scoring processes which are the first
steps in risk measurement that are currently being used by the Indian banks. This test will
identify the risk drivers about which the perception is significantly different when the officer
is appraising and scoring projects under different sectors. The F-score may also point towards
the most critical risk drivers under each sector.

Based on the conclusions of the study on project appraisal process, attitude survey results
on risk drivers of risk scoring and practices of risk management in Indian banks, suitable
suggestions and recommendations will be drawn for the banking system.

4.8.3 Creation of Transition Matrix: The transition matrix is a tool for studying rating
migration of a borrower. It represents rating migration from one rating level to another within
a time-frame of one year. It denotes default probability and migration of the rated borrower to
default grade. The transition matrix provides the profile of credit quality change or migration
that has taken place for the selected 48 projects based on the CRISIL rating format, between
any two selected years. Because the study was done on historical data, migration was noted
for weighted average actual migration achieved on a year-to-year basis for the 5-year period.
The mean transition matrix is a summary of how the rated accounts have migrated during the
selected years and the last column of the matrix indicates probability of default which is a
measure of credit risk.

The process was started by doing mortality-rate analysis of yearly cohorts of companies
for at least two years to find the number of firms in each rating class, each cohorts moving
towards the default category (D). Each cohort comprises all the companies which have a rating outstanding at the start of the cohort year.

Assume there are T(i,d) number of firms migrating to default category out of N(i) number of firms in the Ith rating grade over the one-year period where the I represents the rating grade at the start of the period and D represents default. The probability of default will be Ti, d /Ni. This is under a historic default-experience approach. Pivot (frequency) tables were created for all the rating grades and mean migration; year-to-year was calculated by multiplying Ti, d /Ni with the corresponding weight of the rating class (Bandhyopadhyay, 2007).

4.9 Scheme of Chapterization

The report is organized into seven chapters. The challenges before the infrastructure sector and need for bank finance have been examined in Chapter 1. Chapter 2 identifies the key concepts and reviews the research literature and fills the gaps in research. Chapter 3 studies the banks' practices in project appraisal and risk measurement. Chapter 5 shows the application of these practices in the road and power sectors. This chapter also discusses the two case studies developed for crystallizing these practices in the sectors under focus. Results of the survey, statistical analysis and interpretations are discussed in chapter 6. Based on descriptive and statistical research, suggestions and recommendations are given in Chapter 7. The suggestions are also given on the generic issues and organizational preparedness to improve bank finance to infrastructure.