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Research Methods in Economics

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of the
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QUESTION PAPER

June – 2023

(Solved)

RESEARCH METHODS IN ECONOMICS

M.E.C.-109

Time: 3 Hours]

[Maximum Marks: 100

Note: Attempt questions from each section as per instructions given.

SECTION-A

Note: Attempt the following questions:

Q. 1. What is the role of philosophical perspectives in guiding research methodology of a study? Discuss in detail with an suitable example.

Ans. Ref.: See Chapter-2, Page No. 9, 'Positivists Philosophy of Science', Page No. 10, 'Karl Popper's Philosophy of Science' and Page No. 12, 'Thomas Kuhn's Philosophy of Science'.

Q. 2. What are the criticisms of Hypothetico-Deductive model to the structure of a theory? Discuss.

Ans. Ref.: See Chapter-3, Page No. 19, 'Hypothetico-Deductive Model' and Chapter-2, Page No. 15, Q. No. 7 and Page No. 12, 'Criticism Against Karl Popper's Philosophy of Science'.

Q. 3. Explain research design for a mixed-method research with an example.

Ans. Ref.: See Chapter-6, Page No. 43, 'Mixed Methods', Page No. 44, 'The Rationale for Mixed Methods Research', 'Form of Mixed Methods Research Design' and Page No. 48, Q. No. 9.

Q. 4. How is canonical Correlation Analysis a generalization of Multiple Regression Analysis? Explain.

Ans. Ref.: See Chapter-14, Page No. 135, 'Canonical Correlation Analysis (CCA)', 'Concept and Meaning' Page No. 136, 'Cononical Correlation Analysis as Generalization of the Multiple Regression Analysis'.

SECTION-B

Note: Answer the following questions from this Section:

Q. 5. Discuss the criteria for evaluating measurements in research.

Ans. Ref.: See Chapter-8, Page No. 63, 'Criterion for Good Measurement'.

Q. 6. Discuss how Sen's inequality index is a generalization of Atkinson's index.

Ans. Ref.: See Chapter-11, Page No. 98, 'Atkinson Index' and Page No. 99, 'Sen Index'.

Q. 7. State the data sources of National Income and its related aggregates.

Ans. Ref.: See Chapter-21, Page No. 216, 'Estimates of National Income' and 'Related Macro Economic Aggregates'.

Q. 8. Which quantitative methods can be used for reduction of dimensionality? Briefly discuss any two.

Ans. Ref.: See Chapter-16, Page No. 155, 'Reduction of Dimensionality'.

Also Add: There are several dimensionality reduction methods that can be used with different types of data for different requirements.

Factor Analysis (FA) and Principal Component Analysis (PCA) are both dimensionality reduction techniques. The main objective of Factor Analysis is not to just reduce the dimensionality of the data. Factor Analysis is a useful approach to find latent variables which are not directly measured in a single variable but rather inferred from other variables in the dataset. These latent variables are called factors.

Linear Discriminant Analysis (LDA) is typically used for multi-class classification. It can also be used as a dimensionality reduction technique. LDA best separates or discriminates (hence the name LDA) training instances by their classes. The major difference between LDA and PCA is that LDA finds a linear combination of input features that optimizes class separability while PCA attempts to find a set of uncorrelated components of maximum variance in a dataset. Another key difference between the two is that PCA is an unsupervised algorithm whereas LDA is a

supervised algorithm where it takes class labels into account.

Q. 9. Using a suitable example, discuss the advantages and disadvantages of Action Research.

Ans. Ref.: See Chapter-20, Page No. 209, Q. No. 2 and Page No. 208, 'Advantages and Disadvantages of Action Research'.

Q. 10. Which method is practically more reliable among participant and non-participant observations? Give reasons in support of your answer.

Ans. Ref.: See Chapter-18, Page No. 180, 'Methods of Participatory Research Observation Method' and Page No. 186, Q. No. 3.

Q. 11. Outline the steps for constructing a composite index using Range Equalisation method.

Ans. Ref.: See Chapter-12, Page No. 107, 'Steps in Constructing Composite Index' and Page No. 110, 'Range Equalization Method'.

Q. 12. Differentiate between the following:

(i) Descriptive and Explanatory Research

Ans. Ref.: See Chapter-6, Page No. 41, 'Descriptive and Explanatory Research'.

(ii) Census and Sample

Ans. A census enquiry is one in which all the units connected with the problem are taken into account, while in sample enquiry only some selected representative units are studied.

Therefore, when data are collected of all the units of a population, that method of data collection is known as census method whereas when data is collected for some selected units, then this method is called sample method of data collection.

(iii) Semi-log and Reciprocal models

Ans. Semi-Log Model: One of the common forms of semi-log regression models is the so-called growth rate model. The model is expressed as:

$$\log Y = \alpha - \beta t - U$$

In this model the dependent variable is expressed in log, whereas, the independent variable is the time period, and it is measured in absolute term. Since, log operator is applied only to the left hand side of the equation, the model is called the semi-log model. In this model, the slope coefficient β is a measure of the proportional change in the dependent variable for a unit change in the time period. Thus it measures the growth rate of the dependent variable.

Reciprocal Model: In the reciprocal model, the dependent variable is regressed on the reciprocal of the independent variable. Its functional form is:

$$Y = \alpha + \beta \frac{1}{X} + U$$

Although the model is non-linear in variables (because the power of X is -1), it is linear in parameter. Hence, it can be estimated by the OLS method. The model has an important characteristic. As the independent variable X increases.

Indefinitely, the term $\beta \frac{1}{X}$ approaches zero, being a β constant.

(iv) Narratives and Oral History

Ans. Ref.: See Chapter-18, Page No. 182, 'Narratives' and 'Oral History'.

(v) Retrodution and Abduction

Ans. Ref.: See Chapter-1, Page No. 7, Q. No. 3.



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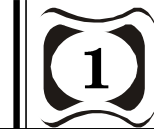
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Research Methods in Economics

BLOCK I : Research Methodology : Issues and Perspectives

Research Methodology : Conceptual Foundation



INTRODUCTION

Research has played an important role in all the fields of human life. Its function in various fields of economics, especially applied economics has been increasing exceptionally. Research is an aid to the economic policy, it helps the policy makers to have knowledge about the complicated nature of the economy and to solve operational and planning related problems of business and industry. Research is a source of providing policy suggestions to various business, government and social organisations. It is, therefore, very important for an economist to understand different techniques of collection of data, tools/methods of analysing data in a systematic manner and arriving at conclusions. This chapter focuses its attention on different parts/steps of the research methodology, research techniques, data types/sources, etc., and also to know as to which type of research approach can be applied to any particular situation, how a research is designed.

CHAPTER AT A GLANCE

RESEARCH METHODOLOGY AND ITS CONSTITUENTS

Research means a search or detailed study to get new information/facts. It means a search again for improvement of knowledge, a process of understanding inter relationship among the facts and the extent to which these facts adhere to the natural laws governing them. There are three different elements of a Research Process, viz., research methodology, research methods and tools/techniques.

Research methodology has the following three elements:

- Orientation (basic aims/beliefs) to guide logics of the research,
- Tools and techniques of data collection, and
- Methods of data analysis.

Research methods include research techniques/tools. Research techniques mean the practical aspects of data collection, organisation and analysis. Various tools include questionnaire, schedules, diaries, check lists, maps, photos/drawings, etc., used in collection/organisation/analysis of data. It is not possible to collect data systematically without having sufficient knowledge of the techniques of data collection. Data analysis requires understanding of the perspective with which the research is being conducted and a sound knowledge of statistical techniques for efficient analysis of the data.

THEORETICAL PERSPECTIVES

Theoretical perspectives are the theories of knowledge lying within the philosophy of social science, having paradigm as its main idea (key concept).

Paradigm: It is a model or a belief system, a thought pattern which guides research and practice. It consists of:

- A philosophy of science that makes certain assumptions about the core issues relating to the nature and characteristics of a reality (ontology—study of being alive/existing) as well as the theory of knowledge concerning how can we know the things that exist (epistemology);
- The theoretical framework, world view (A comprehensive view of the world/human life) guiding the research and practices in the field;

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- System of methods to be used for information/ data collection/data analysis in order to work within the paradigm.

There are the following four world views in social sciences in the context of research approaches:

- Positivism and Post Positivism;
- Critical Theory;
- Interpretivism;
- Pragmatism.

These paradigms differ on the question of reality, give different reasons/purposes of doing research, use different tools for collecting data, contain different ways of getting results from the data collected and they also differ about the relationship between research and practice.

Paradigms are classified into the following three categories:

Realism: It starts by assuming that there is a real world and the main objective research is to understand the world.

Constructivism: It starts by assuming that everybody has distinct experiences/beliefs and no reality exists outside these perceptions.

Pragmatism: It considers realism and constructivism as two alternative ways to understand the world but it thinks that the questions on the nature of reality are less important than the questions about the results of the actions.

The above view-points help researcher in making meaningful choices in respect of :

- The research problem;
- The research questions to investigate the problem;
- Appropriate strategies to find answers to the research questions;
- Approaches to social enquiry that go along with the strategies;
- Theory directing the investigation;
- The sources, forms/type of data;
- Data collection/data analysis methods.

APPROACHES TO SOCIAL ENQUIRY

Two approaches are used in conducting research in social sciences *viz.* quantitative and qualitative

approach. The studies conducted in positivism/post positivism/realism use quantitative approaches. In quantitative research, the emphasis is on making general theories which can be applied universally and well controlled procedures along with a large number of cases are followed in this type of research. But research studies conducted in critical theory and interpretivism paradigms are qualitative. The qualitative studies use induction as a research strategy using flexible designs and try to find out meaning/interpretation on the basis of close contact between the researchers and the people studied. This research comprises procedures which put together the inductive, subjective and contextual approaches.

Another approach that is being used in social enquiries by combining both quantitative and qualitative approaches is known as mixed methods.

Classification of Quantitative Approach

- 1. Inferential Approach:** Here, a database is created by survey method and an inference (opinion) is drawn about the relationship of the variables.
- 2. Experimental Approach:** More control is exercised in the research and some variables are manipulated in order to know its effect on other variables.
- 3. Simulation Approach:** This method involves creating an artificial environment, very close to the real environment, for generating data/ other relevant information and a simulation is run to show the behaviour of the process.

In qualitative approach, a subjective assessment of the opinions/behaviour of the respondents is made and its results are generated in a non-quantitative form by using techniques as group discussions, projective techniques, interviews, etc.

So, quantitative research is a systematic/scientific investigation of the quantitative aspect of the phenomenon with the objective of developing mathematical models and theories. On the other hand, qualitative research deals with qualities of the entities/processes in order to examine/measure by experiments. A comparative analysis of the two approaches is summarised ahead:

Typical Characteristic	Quantitative Approach	Qualitative Approach
Data collection methods	Observations, questionnaire, schedule, structured interviews, etc.	Semi-structured interviews, group discussions, case studies, etc.
Type of questions	Close ended, Multiple choice questions.	Open/loose ended questions.
Selection of respondents	Representative sample of the population (N) selected by Random sample selection, sample size on the basis of assumptions about the population.	Maximum data desirable and sample selection does not work as each respondent is unique.
Timing of data analysis	Data analysis done after its collection.	Analysis keeps going parallel with data collection.
Standard method of analysis	Frequent use of Statistical Methods.	Use of descriptive/mixed methods for data analysis.
Importance/role of theories in analysis	Existing theories are used as a reference for departure, new theories are developed and new concepts are studied.	<i>A-priori</i> deduced theories used on the data and process of analysis is deductive (drawing conclusions logically).

RESEARCH STRATEGIES

While conducting social research, four basic strategies can be used, depending on the belief of the researcher on the paradigm about the nature of reality, as given here under:

Paradigm	Research Strategy
Positivism	Induction
Post positivism/Realism	Deduction
Critical Realism	Retroduction
Interpretativism	Abduction

According to Lewis-Beck (2004), each of the above mentioned research strategy has a different starting point as given here under:

- **Inductive Strategy** starts with data collection, then generalisation is made from them which is used as elementary explanation.
- **The Deductive Strategy** starts with a theory that gives a possible answer and the theory is tested with reference to the problem by collection of data.
- **The Retroductive Strategy** begins with a hypothetical (assumed) model which can explain about happening of the phenomenon.
- **The Abductive Strategy** starts by concepts the areas of society relating to a research problem.

RESEARCH PROCESS

Research process contains different steps that are involved in carrying out the research. Various steps of research can be given as under:

1. Defining the Research problem;
2. Objectives of the research and questions;
3. Review of literature;
4. Formulation of Hypothesis;
5. Research Design;
6. Methods/sources/tools of data collection;
7. Data Analysis;
8. Report Writing.

The above steps/activities are not always in a given sequence but they keep overlapping and are mutually exclusive (cannot both occur, cannot exist/happen together). The above mentioned steps involved in a Research process are explained below:

1. Defining the Research Problem: Selecting/defining research problem is very important and it is the first step in this direction. The research problem must be identified/defined and understood in clear terms and only after that it can be narrowed down in operational terms. The research problem should first be clearly understood and then the problem can be reworded meaningfully from the operational viewpoint. Following points of the problem should be clearly mentioned:

- Rationale/reason behind the problem and the questions for which answers to be sought;

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- Aims/objectives or the research, along with objective of the data to be collected, hypothesis to be tested, data collection/analysis techniques to be adopted;
- Research questions;
- Getting ideas by discussions and re-writing the research problem into a practical statement.

Various steps followed in defining the research problem include stating the problem generally, understanding its nature and looking the literature available. Also, the following points should be kept in mind while defining research problem:

- Defining all technical terms/phrases used;
- Clearly stating the basic assumptions;
- Statement of investigation be provided;
- Time line of the study be stated;
- Sources of data should be mentioned.

2. Review of Literature: This is done to get a clear idea about the topic and to have knowledge about availability of the data/materials about the research. This helps us to know what is available and what is to be searched. The two types of the literature reviewed are: theory/conceptual literature and findings of other studies in the area. Various Journals books, Government Reports, etc., are the main sources of getting literature and also the help of internet can be taken to know about the available literature.

3. Formulation of Hypothesis: Hypothesis (possible explanation for something not yet found to be correct) can be formulated as a proposition/set of propositions that provides most possible explanation for happening of an event. It is tentative statement, yet to be tested/confirmed and may be either accepted or rejected by experiments. Hypothesis is the focus of the research on which research methods are selected. Therefore, a hypothesis must be very carefully formulated. Proper thinking/discussions about the topic and examining the data/material available help the researcher in arriving at the hypothesis. Exploratory research does not require hypothesis formulation.

4. Research Design: It is the blueprint according to which collection, measurement and analysis of data is conducted, a set of methods/procedures to be used in the research and an overall strategy for integrating various components of the study.

5. Collection of Data: Data can be primary data (collected by the researcher) or secondary data (already available/published). The two main techniques/methods of data collection are:

- (i) Census/survey and
- (ii) Observation method.

Primary data can be obtained from the field by observation, case study, interviews, etc. and by survey (by using questionnaire containing specific questions for extracting specific data from a group of people).

6. Analysis of Data: It is a process of organising and inspecting data collected in a manner to get conclusions there from. The various steps involved in data analysis include categorization (classifying responses obtained on the basis of research problem / hypothesis), coding (grouping rows to facilitate comparison), etc.

7. Report Writing: A Research Report must be clear and original and it should be presented in such a way that the readers can retain its contents and easily understand the methodology/findings. Here, the analytical ability and communication skills of the research team are tested. The report contains the following in two parts:

Preliminary Pages: It contains title of the study, name(s) of research team members/Institution for which conducted, preface with the context/key findings/acknowledgement of sources.

The Main Text: It starts by major aspects of the study organised in different chapters. The introductory chapter includes objective of the study, its rationale, a summary of the literature review, hypothesis tested and definition of major concepts used, the methods adopted in the study and the limitations. Thereafter, the main text should contain the report properly arranged in logical sequence, split into sections/sub-sections and the inter connections between various sections so that the report could be understood easily. At the end of the report, the implications (conclusions drawn) of the study containing the following should be mentioned:

- Inferences (opinion formed on the basis of information) from the study and the conclusions drawn relating clearly to the objective/hypothesis already stated;
- The conditions which may restrict (limit) the degree to which inferences drawn can be generalised;
- Questions that remain unanswered and areas where further research could be conducted;
- The Report may include an 'Executive Summary' giving a brief picture of the complete report. This is placed at the beginning of the report to give an idea about the entire report.