

Contents

| | |
|---|--------------|
| <i>Declaration</i> | <i>i</i> |
| <i>Certificate</i> | <i>ii</i> |
| <i>Acknowledgment</i> | <i>iii</i> |
| <i>List of Tables</i> | <i>iv</i> |
| <i>List of Figures</i> | <i>v</i> |
| <i>List of Abbreviation</i> | <i>vi</i> |
| CHAPTER 1. INTRODUCTION | 1-16 |
| 1.1. Development and Infrastructure | 1 |
| 1.2. Meaning and Importance of Infrastructure | 2 |
| 1.3. Power Sector in India: History and Overview | 5 |
| 1.4. Power Sector in India: Background of the Legislative Initiatives | 6 |
| 1.4.1. The Indian Electricity Act, 1910..... | 8 |
| 1.4.2. The Electricity (Supply) Act, 1948..... | 8 |
| 1.4.3. The Electricity Regulatory Commission Act, 1998..... | 9 |
| 1.4.4. The New Electricity Act, 2003 | 9 |
| 1.4.5. National Electricity Policy 2005 | 10 |
| 1.4.6. Electricity Tariff Policy 2006 | 10 |
| 1.4.7. Power Sector Restructuring in India..... | 11 |
| 1.5. Energy Scenario: World versus India | 12 |
| 1.6. Installed Generating Capacity in India | 13 |
| 1.7. Statement of the Problem and Objectives of the Study | 14 |
| 1.8. Organization of the Study | 16 |
| CHAPTER 2. LITERATURE REVIEW | 17-41 |
| CHAPTER 3. PROFILING POWER SECTOR IN INDIA | 42-58 |
| 3.1. Power Sector in India: Past to Present | 42 |
| 3.2. Power Generation from Hydro and Thermal Sources..... | 43 |
| 3.3. State wise Installed Capacity in India..... | 45 |
| 3.4. Per Capita Electricity Consumption in India | 47 |
| 3.5. Electricity Demand and Supply Scenario in India..... | 49 |

| | |
|---|----|
| 3.6. Consumption of Energy by Various Consumer Categories | 53 |
| 3.7. Relative Share in Total Consumption in Electricity | 56 |
| 3.8. Power Sector Reforms in India | 57 |

CHAPTER 4. DATA SOURCES AND RESEARCH METHODOLOGY 59-65

| | |
|--|----|
| 4.1. Introduction..... | 59 |
| 4.2. Research Design and Time Frame | 59 |
| 4.3. Data Description and Sources | 59 |
| 4.4. Modeling Criterion..... | 60 |
| 4.4.1. Stationarity | 60 |
| 4.4.2. Co-integration Test..... | 61 |
| 4.4.3. Granger Causality Test | 62 |
| 4.4.4. LM Test for Auto-correlation | 62 |
| 4.4.5. The Jarque -Bera (JB) Test for Normality..... | 63 |
| 4.4.6. Data Envelopment Analysis (DEA) | 63 |
| 4.4.7. Malmquist DEA Method | 64 |

CHAPTER 5. CAUSAL RELATION BETWEEN ELECTRICITY CONSUMPTION AND ECONOMIC GROWTH 66-73

| | |
|---|----|
| 5.1. Introduction..... | 66 |
| 5.2. Unit Root Test..... | 66 |
| 5.2.1. Unit Root at Level | 66 |
| 5.2.2. Unit Root at Level One..... | 68 |
| 5.2.3. Unit Root at Level Two..... | 68 |
| 5.2.4. Johansen Co-Integration Test | 69 |
| 5.2.5. Granger Causality Test | 70 |
| 5.3. LM Test for Autocorrelation | 71 |
| 5.4. Jarque-Bera (JB) Test of Normality | 72 |

CHAPTER 6. TECHNICAL EFFICIENCY OF POWER SECTOR IN INDIA: DATA ENVELOPMENT ANALYSIS (DEA) 74-80

| | |
|---|----|
| 6.1. Introduction | 74 |
| 6.2. Data Envelopment Analysis (DEA) | 74 |
| 6.3. Malmquist Productivity Index | 75 |
| 6.4. Productivity Change by Group Categories..... | 77 |

| | |
|--|----------------|
| CHAPTER 7. FINANCIAL PERFORMANCE OF POWER SECTOR IN INDIA | 81-92 |
| 7.1. Introduction | 81 |
| 7.2. Cost Structure of Indian Power Sector | 81 |
| 7.2.1. Fuel Cost | 83 |
| 7.2.2. Power Purchase Cost | 83 |
| 7.2.3. Establishment and Administration Cost | 85 |
| 7.2.4. Operation and Maintenance (O & M) Expenditure | 85 |
| 7.2.5. Fixed Cost..... | 85 |
| 7.3. Tariff and Revenue Realisation | 86 |
| 7.4. Comparative Analysis of Average Cost and Average Revenue | 89 |
| CHAPTER 8. CONCLUSION AND POLICY IMPLICATIONS | 93-98 |
| 8.1. Conclusion..... | 93 |
| 8.2. Policy Implications | 95 |
| 8.3. Limitations and Future Scope of the Study | 97 |
| Bibliography | 99-107 |
| Appendices | 108-120 |