WORKING CAPITAL MANAGEMENT AND PROFITABILITY: A STUDY ON SELECT POWER DISTRIBUTION UTILITIES IN INDIA

A Thesis submitted to the University of Hyderabad in partial fulfillment for the award of the degree of

DOCTOR OF PHILOSOPHY

IN

MANAGEMENT

By

SYED AZHAR

Reg. No: 09MBPH03

Under the Supervision of

Dr. V. MARY JESSICA

SCHOOL OF MANAGEMENT STUDIES

UNIVERSITY OF HYDERABAD

HYDERABAD, TELANGANA, INDIA-500046

OCTOBER, 2016

DECLARATION

I, SYED AZHAR, hereby declare that the thesis entitled, **"Working Capital Management and Profitability: A Study on Select Power Distribution Utilities in India"**, submitted by me under the Research Supervision of **Dr. MARY JESSICA** is an original and Independent research work free from plagiarism. I also declare that, it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any Degree or Diploma. I hereby agree that my thesis can be deposited in Shodganga/ INFLIBNET.

Place: **Hyderabad** **SYED AZHAR**

Date: Reg. No: 09MBPH03

CERTIFICATE

This is to certify that the thesis titled "Working Capital Management and Profitability: A Study on Select Power Distribution Utilities in India", submitted by SYED AZHAR bearing Regd. No. 09MBPH03, enrolled for Ph.D. programme at the School of Management Studies, University of Hyderabad, is a bonafide work as prescribed under Ph.D. ordinances of the University and UGC.

The thesis has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

Dr. V. MARY JESSICA
Associate Professor
School of Management Studies
University of Hyderabad

Prof. B. Raja Shekhar
Dean
School of Management Studies
University of Hyderabad

Acknowledgement

I would like to express my thanks to School of Management Studies for given me an opportunity to pursue doctoral program at the School of Management Studies, University of Hyderabad. I would like to express my sincere gratitude to my Supervisor Dr. V. Mary Jessica for the continuous support for my Ph.D study and research, for her patience, motivation, enthusiasm, and immense knowledge. Her guidance has helped me throughout the doctoral research and writing of this thesis. I could not have imagined having a better advisor and mentor for my Ph.D study.

Besides my Supervisor, I would like to express my gratitude to my doctoral committee members: Prof. V.Venkataramana, Dr. P. Jyothi and Dr. S. Mallikarjuna Rao for their encouragement, insightful comments, and hard questions.

I thank Prof. B. Raja Shekhar, Dean, School of Management Studies for his vital advice and encouragement. I also thank other faculty members, Prof. Sita Vanka, Dr. Chetan Srivastava, Dr. Sapna Singh, Dr. D.V. Srinivas Kumar and Dr. K. Ramulu for encouraging me.

My thanks are also due to the office staff of the School of Management Studies: Sri Krishnamurthy, Sri Naganna, Smt Parimala, Sri Srinivas Rao, and Smt Rebecca. I also thank the School support staff Narsing Rao, Mallesh, Sheetal Singh, Somnath and Chandra Mohan for their unstinting support and assistance.

I am also indebted to the library staff of Jamia Millia Islamia (Central University), The Ratan Tata Library - University of Delhi, Institute of Public Enterprises-Hyderabad, Administrative Staff College of India –Hyderabad, Kakatiya University – Warangal and IGML of University of Hyderabad. I also thank the University Grant Commission for granting the Maulana Azad National Fellowship for minorities to me at the right time, which provided financial support throughout my Ph.D work.

I am thankful to the Directors, Chief General Managers, General Managers of Human Resources Department, Finance & Accounts and Revenue Department, Company secretary of state power distribution utilities for helping me in data collection and also

providing me the required data and information for the present study, without which the research work could not have been completed. Further I am also grateful to the human resources and finance department staff of state regulatory commission.

I thank my fellow research scholars K.N Marimuthu, Renuka, B.Ramesh, Ruksana, Lakshmi, Kamala, Appa Rao, Asif , Kranti, Mahesh, Mahapatra, Prem singh, Aashish for their co-operation in my research work.

I find no words to express my deep sense of gratitude for unending motivation and support given by my parents, Father –Syed Aziz, my loving mother – Zaheda Begum, my sister-Khaiser Begum, my wife - Shaik Jabeen Taj , Sister-in-law- Farheen Begum and my brothers - Syed Saleem and Syed Adil for being consistent sources of strength and inspiration during the entire period of research work.

- **SYED AZHAR**

ABSTRACT

The power distribution utilities are an important segment of the power sector which supplies electricity to the final consumer. It is a junction where the end consumers are charged for consumption of electricity. For this reason, the power distribution utilities are an actual revenue generator in power sector. The financial health of these distribution utilities has a direct impact on the financial of power generation and transmission companies. Further, distribution utilities are suffering from problems such as poor collection of receivables, irregularities in payments made by government owned bodies, poor financial and low credibility, inability to raise funds for short term and long term use etc. Therefore the researcher has made an attempt to study the short-term financial position by understanding the impact of working capital management and profitability and also understand the management of working capital policy, financing of working capital, cash management and receivables management of select distribution utilities in India.

The study found that there is inconsistency in the management of working capital and the overall liquidity position of the utilities is not appropriate. It is also found that private owned power distribution utilities maintain higher proportion of cash level to current liabilities in comparison with state owned power distribution utilities. Subsequently it is also found that one fourth of the utilities fail to collect more than 10% of revenues from debtors and only five utilities make timely payments to creditors. The study also found that half of the sample utilities have low and negligible average return on capital employed and collection efficiency and interest coverage ratio have a significant impact on the profitability of sample utilities. Further due to weak financial position and performance, the utilities are having difficulty in procuring working capital finance. The utilities maintain a low cash levels due to the nature of the industry. Mostly agricultural category of consumers contributes to bad debts. Further inaccurate billing, late receipt of subsidies from government, late payment made by consumers, inadequate metering, revenue leakages due to unbilled are some of the problematic areas in receivables management.

The study suggested that cash management of firms is an important aspect of working capital. To enhance the efficiency of cash management, collections and disbursements of cash must be properly monitored. Surplus cash should be invested in short-term marketable securities. Another important component is receivables, due attention must be given for the prompt collection of debtors, and measures should be taken to avoid doubtful and bad debt losses. Collection efficiency should be improved by reducing bad debts and increasing current dues from all the set of consumers.

BRIEF CONTENTS

List of Tables

List of Figures

LIST OF APPENDIX Page No.

List of Abbreviations

Abbreviation	Full Name
ACS	Average Cost of Supply
ADB	Asian Development Bank
ALR	Absolute Liquidity Ratio
AP	Andhra Pradesh
AVVNL	Ajmer Vidyut Vitran Nigam Limited
APCPDCL	Andhra Pradesh Central Power Distribution Company Limited
APNPDCL	Andhra Pradesh North Power Distribution Company Limited
APEPDCL	Andhra Pradesh Eastern Power Distribution Company Limited
APSEB	Andhra Pradesh State Electricity Board
APSPDCL	Andhra Pradesh Southern Power Distribution Company Limited
ARR	Average Revenue Realized
AT&C	Aggregate Technical & Commercial
BESCOM	Bangalore Electricity Supply Company Limited
CA	Current Assets
CAGR	Compounded Annual Growth Rate
CCC	Cash Conversion Cycle
CE	Collection Efficiency
CERC	Central Electricity Regulatory Commission
CESCOM	Chamundeshwari Electricity Supply Corporation Limited
CEO	Chief-Executive Manager
CESCO	Central Electricity Supply Utilities.
CGM	Chief General Manager
CL	Current Liabilities
CTR	Creditors Turnover Ratio
CV	Coefficient Of Variation
DER	Debt-Equity Ratio
DGM	Deputy General Manager
DGVCL	Dakshin Gujarat Vij Company Limited
DISCOM	Distribution Company
DTR	Debtors Turnover Ratio
GESCOM	Gulbarga Electricity Supply Company Limited
GLS	Generalised Least Square
HESCOM	Hubli Electricity Supply Company Limited
ICR	Interest Coverage Ratio
JDVVNL	Jodhpur Vidyut Vitran Nigam Limited
JVVNL	Jaipur Vidyut Vitran Nigam Limited
KW	Kruskal Wallis
Kwh	Kilowatt-Hour
LR	Liquid Ratio

L.T	Low Transmission
MW	Mega Watts
MGVCL	Madhya Gujarat Vij Company Limited
MP	Madhya Pradesh
MPMKVVCL	Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited
MPPKVVCL	Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Limited
MPPVKVVCL	Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company Limited
NESCO	North Eastern Electricity Supply Company of Odisha Limited
NWC	Net Working Capital
OLS	Ordinary Least Square
PAT	Profit After Tax
PFC	Power Finance Corporation
PGVCL	Paschim Gujarat Vij Company Limited
PPP	Public Private Partnership
PSU	Public Sector Undertaking
QR	Quick Ratio
RES	Renewable Energy Sources
SEB	State Electricity Board
SESCO	Southern Electricity Supply Company of Odisha Limited
SERC	State Electricity Regulatory Commission
SD	Standard Deviation
SPSS	Statistics Is A Software Package Used For Statistical Analysis
T&D	Transmission And Distribution
WESCO	Western Electricity Supply Company of Odisha Limited
UGVCL	Uttar Gujarat Vij Company Limited
ULB	Urban Local Bodies

Chapter – 1

An Overview of Power Sector In India

1.1 Introduction

Power sector is an important driver of economic development. It is the key source of input due to which its importance cannot be ignored for the overall development of the economy as a whole. It is an indispensable infrastructure in any economy. Without electricity, other sectors cannot operate their business because electricity is the basic requirement to run the business. Even the domestic consumers use electricity to operate devices at home for their work. The Indian economy is poised for higher economic growth in the years to come. This will require a large investment in the infrastructure sectors including the power sector.

India is one of the major energy producers and consumers in the world. It currently ranks as the world's seventh largest energy producer, accounting for about 2.49% of the world's total annual energy production, and fourth largest consumer of electricity (MOSPI, 2014). India during the post-independence period had made rapid strides judged in terms of indicators like the quantum of electricity generation, installed generating capacity, per capita consumption of electricity, the number of villages electrified etc. According to Central Electricity Authority report, 2015; "The installed generating capacity in the country in 1947 was meager 1362 MW which catered to power requirements of urban centers and adjoining areas with electrification of around 1500 Villages." The power generating capacity in the country has since grown manifold to 267 GW at the end of March 2015. Further India is likely to add 600 GW to 1200 GW of additional new power generation capacity before the year 2050. However, per capita, consumption of electricity remains much lower than the world average and even lower than some of the developing Asian Economies (Singh, 2007).

1.2 Regulation in Power Sector

In 1910, Indian Electricity Act was introduced to provide a basic framework for electricity supply industry in India. In 1948, Electricity Supply Act was implemented to establish an authority at central level to monitor electricity sector at centre and to establish state electric board to supply electricity to remote areas of the state.

Table No.1.1: Regulation in Power Sector

Law/Policies	Objective	Impact
The Electricity Act, 1910	Infrastructure framework for supply of electricity	Attracted private capital
The Electricity Act, 1948	Mandated creation of SEB's	Ownership in the hands of SEBs
IIP Process, 1991	Private investment in generation	Projects from private players came into generation
The Electricity Amendment Act, 1910	Making transmission a separate entity	Central transmission utility & State transmission utility were setup
Mega Power Policy, 1995	Setting up of mega power plants	Mega power plants get benefited
The Regulatory Commission Act, 1998	Provision of setting up of central / state electricity regulatory commission	Independent regulatory mechanism
National Electricity Policy	Competition and protection of consumers	More players were influenced to invest and more efficient consumer service
Electricity Act, 2003	Proving reliable and quality power to customers at reasonable rate	Investments in capital additions
National Tariff Policy	Tariff setting	Attractive tariff for players

Source: D&B Industry Research Service (Cited in Power of the Planet – Sustainability Disclosures by the Indian Power Sector, 2015)

Amendments to the Indian Electricity Supply Act were brought about in 1975, 1991 and 1998 due to improper performance of state electricity boards (SEB's) characterized by low labour productivity and shortages in power supply, insufficient tariffs charged to cover costs amounting to huge financial losses for the SEBs. In 1998, Electricity Regulatory Commission Act was established for setting up of the Central Electricity Regulatory Commissions (CERC's) and State Electricity Regulatory

Commissions (SERC's) with powers to determine electricity tariffs. CERC's was liable to account for all centrally owned power stations and other interstate stations, while SERCs were responsible for stations within their own jurisdiction of state (Planning Commission Report, 2012).

The Electricity Act, 2003 was implemented with the objective to provide reliable and quality power to customers at a reasonable rate. It increased competition and opened avenues of electricity at cheaper price. The Table No.1.1 depicts the regulations in power sector which were enforced during different points of time, its objectives and the impact it created to improvise the reliability and quality of electricity.

1.3 Installed Generating Capacity in India

Installed electricity capacity is the electricity production capacity of a particular facility. It is usually expressed in Megawatts (or sometimes even Gigawatts) and can come from hydraulic, nuclear, thermal, solar or wind power. The Table No. 1.2 presents the growth of installed generating capacity in India through various modes from the year 1947 to 2015. During 1947, the total installed generating capacity was 1362 MW comprising of Hydro and thermal power generating capacities contributing 508MW and 854 MW respectively. The total installed generating capacity was recorded as 1362MW in 1947, but by the end of 2015, it has increased to 271722 MW.

Table No.1.2: Total Installed Generating Capacity of Power Generation (1947-2015)

Year	**1947**	**1950**	**1956**	**1961**	**1966**	**1969**	**1974**
Total	1362	1713	2886	4653	9027	12957	16664
Year	**1979**	**1980**	**1985**	**1990**	**1992**	**1997**	**2002**
Total	26680	28448	42585	63636	69065	85795	105046
Year	**2008**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Total	143061	159398	173626	199877	223343	245259	271722

Source: Central Electricity Authority

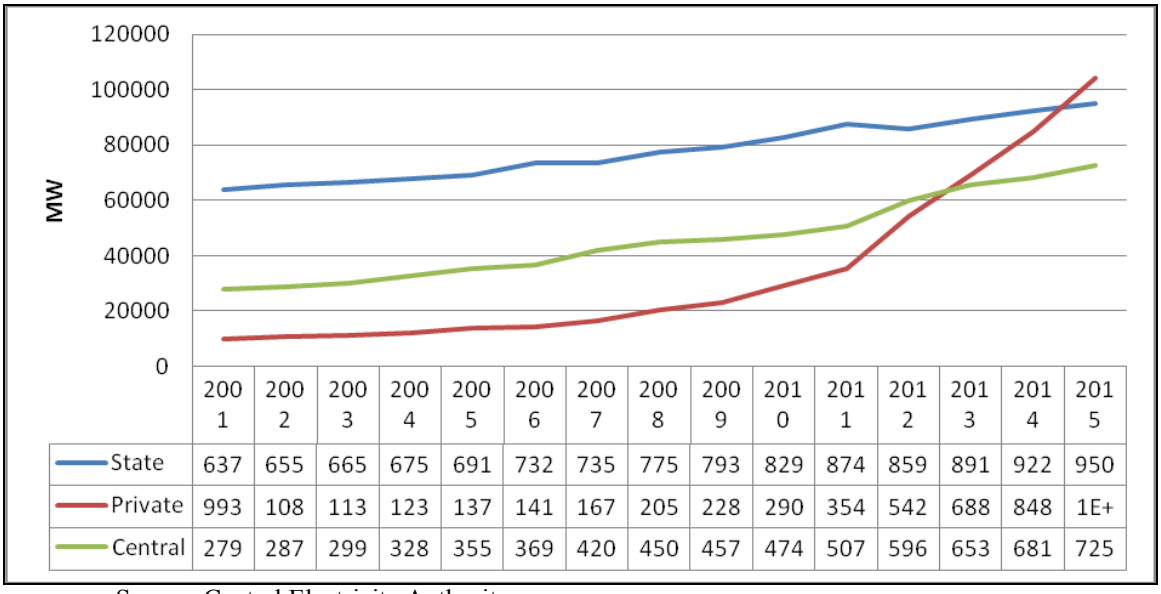
1.3.1 Sector Wise Growth of Generation Capacity

The Figure 1.1 shows sector-wise growth of generation capacity (MW) for the period of 2000 to 2015. In the year 2000, the state sector had contributed about 64% of

the total installed generating capacity while central sector contributed 27%, and the rest 9% was contributed by the private sector. Since then the private sector has increased the installed generating capacity and contributed to a major share of installed power generating capacity. It is evident from the figure that private sector has surpassed both state and central sector in terms of installed generating capacity by the end of 2015. Further, the total installed capacity of the state, central and private sectors are 95079 MW, 72521 MW and 104122 MW respectively in the year 2014-15.

The Figure 1.1 shows that both state and central sectors have improved gradually over the period of 2000-2015 but the private sector has gradually improved till 2011 and then took a step increase in installed generating capacity and surpassed state sector in the year 2014.

Figure 1.1: Sector-Wise Growth of Generation Capacity (In MW) (2000-2015)



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
State	637	655	665	675	691	732	735	775	793	829	874	859	891	922	950
Private	993	108	113	123	137	141	167	205	228	290	354	542	688	848	1E+
Central	279	287	299	328	355	369	420	450	457	474	507	596	653	681	725

Source: Central Electricity Authority

1.4 Source of Power Generation

The power is generated through hydro, thermal, gas/liquid, nuclear, and other types of electricity generation. The nuclear source of energy did not exist till 1969; later in the 4th year plan it was added and contributed a capacity of 640 MW of electricity.

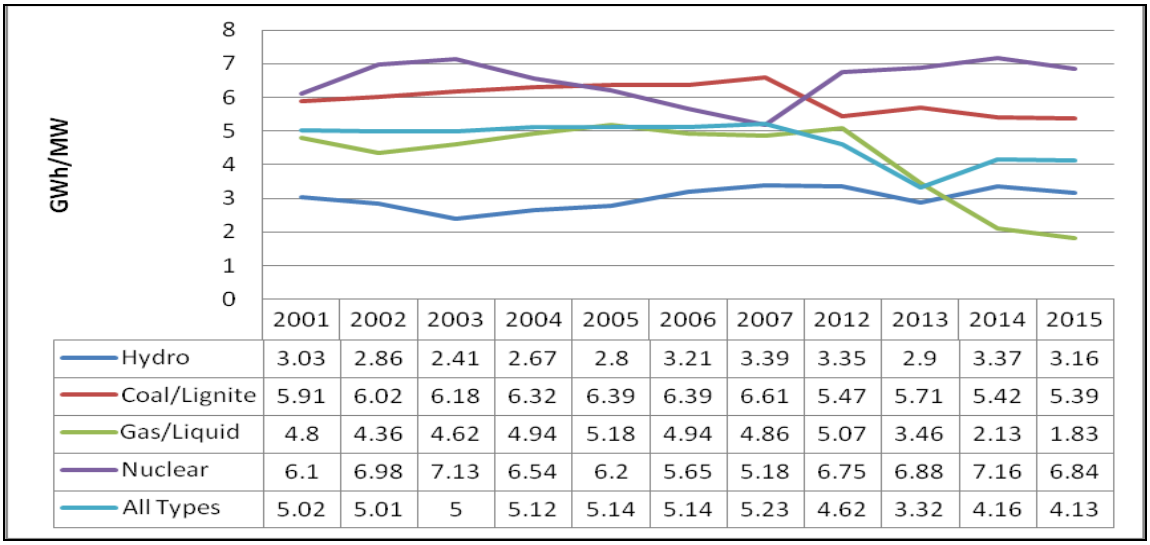
Even the Gas base thermal plants came into force in the 3rd year plan, adding an installed generating capacity of 134 MW of Electricity.

In terms of contribution to the total installed generating capacity, thermal power has been a leader from the era of independence to till date. It means that India has been largely dependent on the non-renewable source of power i.e., coal based thermal power in power generation.

With the beginning of 4th five-year plan, the nuclear power generation was started with an installed generating capacity of 640 MW and further no addition of new capacity took place until the end of 1980. There has been very slow growth rate in nuclear power generating capacity. The Renewable energy source of power generation has come into existence at the end of 1990 with a very minimal contribution of 32 MW of energy. After liberalization, the government has focused on the renewable sources of energy. Within a span of two decades, there has been a high growth rate in installed power generating capacity in Renewable Energy Sources.

Figure No. 1.2: Generation by All India Power Stations - Mode Wise Utilities

(As on April, 2015)



	2001	2002	2003	2004	2005	2006	2007	2012	2013	2014	2015
Hydro	3.03	2.86	2.41	2.67	2.8	3.21	3.39	3.35	2.9	3.37	3.16
Coal/Lignite	5.91	6.02	6.18	6.32	6.39	6.39	6.61	5.47	5.71	5.42	5.39
Gas/Liquid	4.8	4.36	4.62	4.94	5.18	4.94	4.86	5.07	3.46	2.13	1.83
Nuclear	6.1	6.98	7.13	6.54	6.2	5.65	5.18	6.75	6.88	7.16	6.84
All Types	5.02	5.01	5	5.12	5.14	5.14	5.23	4.62	3.32	4.16	4.13

Source: Central Electricity Authority

In the year 2000, power generated through hydro, coal, gas, nuclear and other types contributed 3.03 GW, 5.91 GW, 4.80 GW, 6.10 GW and 5.02 GW respectively. The majority of the power is generated through nuclear plant followed by coal, gas/liquid

hydro and other forms of power generation. Over the year, power generation through gas/liquid has decreased and moreover other forms of power generation such as nuclear, hydro and coal has improved insignificantly by the end of 2015. The graph shows that gas/liquid source of power generation has decreased drastically from 4.36GW to 1.83 GW by the end of 2015.

1.5 Plan-Wise Growth of Electricity Sector in India

Plan wise growth of electricity sector in India can be explained with the indicators such as number of villages electrified and transmission and distribution lines.

1.5.1 Number of Villages Electrified

The Table 1.3 (Page.7) shows the number of villages electrified during the period of 1947 to 2015. In 1950, the number of villages electrified was 3061. As we find that there is an increasing trend of village electrification from the 1st five-year plan. If we see the growth pattern there has been consistent growth till the end of 2011. The 6th five-year plan has witnessed a tremendous growth rate among all the five-year plans with an additional rural electrification of 1, 20,533 villages. Table 1.3 shows the number of villages electrified from 1947-2015.

Since independence, the growth in number of villages electrified was tremendous until the end of 1985. In the further years, there was an increase in the number of villages electrified but the growth was small.

1.5.2 Transmission & Distribution (T&D) Lines

The T&D lines are used to transmit electricity from the power generating units to the end users. The end users of electricity can be domestic users, non-domestic, industrial (low tension), cottage industries, agriculture, public bodies, general purpose, temporary usage, high tension customers.

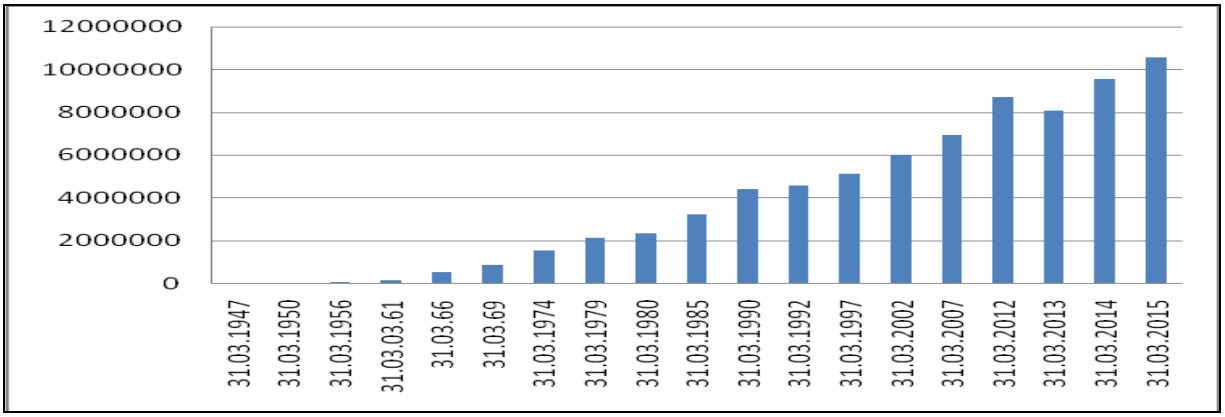
Table No. 1.3: Number of Villages Electrified (1947 - 2015)

As on / during financial year ending with	No. of villages electrified	Growth (%)	As on / during financial year ending with	No. of villages electrified	Growth (%)
31.12.1947	N.A.	-	31.03.1997(End of the 8th Plan)	498836	102.67
31.12.1950	3061	238.29	31.03.2002(End of the 9th Plan)	512153	94.28
31.03.1956(End of the 1st Plan)	7294	298.25	31.03.2007 (End of 10th Plan)	482864	100.93
31.03.1961(End of the 2nd Plan)	21754	207.54	31.03.2008 (1st year of 11th Plan)	487347	102.03
31.03.1966 (End of the 3rd Plan)	45148	163.33	31.03.2009(2nd year of 11th Plan)	497236	100.74
31.03.1969(End of the 3 Annual Plans)	73739	212.55	31.03.2010 (3rd year of 11th Plan)	500920	107.39
31.03.1974(End of the 4th Plan)	156729	148.52	31.03.2011 (4th year of 11th Plan)	537947	103.47
31.03.1979(End of the 5th Plan)	232770	107.32	31.03.2012 (End of11th plan	556633	100.70
31.03.1980(End of the 2 Annual Plans)	249799	148.25	31.03.2013 (End of 1st year of 12th plan)	560552	102.12
31.03.1985(End of the 6th Plan)	370332	127.14	31.03.2014(End of IInd year of 12th plan	572414	102.11
31.03.1990(End of the 7th Plan)	470838	103.47	31.03.2015(End of IIIrd year of 12th plan	577629*^	100.91
31.03.1992(End of the 2 Annual Plans)	487170	102.39			

Source: Central Electricity Authority

Not Available (N.A); (*) Provisional; ^ As per revised definition of village electrification and 2001 census; (#) Includes 440 Volts Distribution Lines.

Figure No. 1.3: Length of T & D Lines (Ckt. Kms) (#) – 1947-2015



Source: Central Electricity Authority

The total length of T & D lines measured about 23238 Ckt. Kms in 1947. But at the end of 2015, the length of T&D lines measured to 10558177 Ckt. Kms. There has been a growth of 454.34 fold from 1947 to 2015.

1.6 Investment in Power Sector

According to DFID, 2002 (as cited in Singh, 2007), during the 1990s, up to 70% of infrastructure funding came from the public sector, followed by the private sector (20–25%) and official development assistance (5–10%). Between 1992 and 2003, infrastructure investment in developing countries was estimated to be USD622 billion - an average of USD52 billion a year and representing 3.8% of total gross domestic investment in the developing world. Approximately two-thirds of this investment was in East Asian and Latin American countries. South Asian countries have lagged behind in this aspect (World Bank, 2005b). Some of the developing countries, including India, are making progress in their efforts to induce private investment in the power sector. However, improving growth prospects in domestic markets may encourage international project promoters to look inward to their own domestic markets unless lucrative returns are forthcoming under an appropriate investment climate.

McKinsey and Company (2014) report has indicated the fact that India requires investments of US$ 600 billion to cater to the growing power demand across the value chain. Around US$ 300 billion will be necessary to facilitate generation whereas

transmission sector requires US$ 110. Further distribution segment requires an investment of US$ 190 billion.

1.7 Power Distribution Utilities in India

Power distribution utilities are a segment of the power chain and the supplier of electricity to the final consumer. It is a place where the end consumers make payments for the consumption of electricity. Hence power distribution utilities are the actual revenue generator in power sector. It caters to nearly 200 million consumers with a connected load of about 400 GW that places the country among the largest electricity consumer bases in the world (Indian Power Sector). However being the most important segment of the power sector, power generation has drawn government attention due to the high energy deficit and massive capacity addition.

Power distribution utilities are mainly controlled by the state government as the distribution of electricity comes in the concurrent list in the Constitution. After privatization, few states have opted to unbundle power sector and privatize power distribution utilities. Distributing power is a state level subject and hence these utilities are responsible for supplying electricity to both rural and urban customers. The rural consumers are described as largely wide dispersal of the network in large areas with long lines, high cost of supply, low paying capacity of the consumers, large number of subsidized consumers and un-metered / flat rate supply to farmers, whereas the urban consumers are distinguished by high consumer density and higher load growth rate. The significant challenges faced by power distribution utilities are poor financial health, improper tariff, AT&C losses etc.

Power distribution is also a vital aspect in the power sector. Its financial health has a direct impact on the power generation and transmission companies. Therefore there is a need to maintain sound and healthy position of these utilities.

1.8 Restructuring / Unbundling of State Electricity Utilities

The Electricity (Supply) Act, 1948, predicted the creation of State Electricity Boards (SEBs) for planning and implementing of power development program in their

respective States. All state electricity utilities such as generation, transmission and distribution were running under the control of State Electricity Board (SEB). Due to prevailing high losses in power sector, an initiative was taken to unbundle the power generation, transmission and distribution from single entity namely SEBs and corporatizing the same for the above activities to improve efficiency levels in each of the areas.

The poor financial status and operational efficiency of SEBs / state utilities imposed a heavy burden on the economic resources of the respective state governments. On the financial side, the lack of expenditure prudence and skewed tariff structure has led to a deterioration of the financial health of state utilities. The financial position of the state electricity boards has been steadily deteriorating, the commercial loss incurred by all the SEBs have increased by 50% between 1992 and 1995. Poor operational and technical efficiency, along with the above factors, has resulted in ballooning financial losses in the sector. "The commercial losses of SEBs (before subsidy) during 2001–02 were estimated to be Rs.331.77 billion as compared to Rs.113.05 billion during 1996–97" (Vasudeva, 2010). A significant proportion of this loss is of a non-technical nature, primarily due to theft of electricity. Further distribution utilities have poor records of collection efficiency in many states, which subsequently lead to cash flow problems.

1.9 Status of Unbundling State Electricity Boards

The Table No.1.4 shows the status of unbundling state electricity boards in different states. It indicates how far process of unbundling has completed. The process of unbundling started in 1995. Most of unbundled SEB's follows a separate generation and transmission with a separate distribution utility performing independently.

The power distribution utilities can be further divided according to the area of operation within the state. Few states such as Andhra Pradesh, Gujarat and Odisha are operating with four distribution utilities, while Madhya Pradesh, Delhi and Rajasthan are operating with three discoms. States such as Uttar Pradesh and Karnataka are operating with 6 and 5 distribution utilities respectively.

Table No. 1.4: Status of Unbundled Power Distribution Utilities

S.No	State	industry Structure	Unbundling /Discoms formation	Sector	Power Distribution Utilities
1.	Odisha	G+T+4D	1995/1998	Private	Central Electricity Supply Company of Odisha Ltd. , North Eastern Electricity Supply Company of Odisha Ltd., Southern Electricity Supply Company of Odisha Ltd., Western Electricity Supply Company of Odisha Ltd.
2.	Haryana	G+T+2D	1998/1999	Public	Uttar Haryana Bijli Vitran Nigam Limited, Dakshin Haryana Bijli Vitran Nigam Limited
3.	Rajasthan	G+T+3D	2000	Public	Jaipur Vidyut Vitran Nigam Limited, Ajmer Vidyut Vitran Nigam Limited, Jodhpur Vidyut Vitran Nigam Limited
4.	Uttar Pradesh	G+T+6D	2000/2003	Public	Dakshinanchal Vidyut Vitran Nigam Ltd., Kanpur Electric Supply Co. Ltd. , Madhyanchal Vidyut Vitran Nigam Ltd., Paschimanchal Vidyut Vitran Nigam Ltd, Purvanchal Vidyut Vitran Nigam Ltd.
5.	Uttarakhand	G+T+D	2001/2004	Public	Uttarakhand Power Corporation Ltd
6.	Andhra Pradesh	G+T+4D	1999/2000	Public	Central Power Distribution Company of Andhra Pradesh limited, Southern Power Distribution Company of Andhra Pradesh Limited , Eastern Power Distribution Company of Andhra Pradesh Limited, Northern Power Distribution Company of Andhra Pradesh Limited
7.	Delhi	G+T+3D	2002	Private	BSES Rajdhani Power Ltd. , BSES Yamuna Power Ltd., North Delhi Power Ltd.

8.	Madhya Pradesh	G+T+3D	2002	Public	Madhya Pradesh Paschim Kshetra Vidyut Vitran Co. Ltd., M.P. Poorv Kshetra Vidyut Vitran Co., M.P.Madhya Kshetra Vidyut Vitran Co.
9.	Karnataka	G+T+5D	2002	Public	Bangalore Electricity Supply Company Limited, Mangalore Electricity Supply Company Limited, Hubli Electricity Supply Company Limited, Gulbarga Electricity Supply Company Limited, Chamundeshwari Electricity Supply Corporation Limited
10	Assam	G+T+2D	2003	Public	Lower Assam Electricity Distribution Company Ltd., Upper Assam Electricity Distribution Company Ltd
11	Gujarat	G+T+4D	2005	Public	Dakshin Gujarat Vij Company Limited, Uttar Gujarat Vij Company Limited , Madhya Gujarat Vij Company Limited, Paschim Gujarat Vij Company Limited
12	Maharashtra	G+T+D+H	2005	Public	Maharashtra State Electricity Distribution Company Limited
13	West Bengal	G+T+D	2007	Public	West Bengal State Electricity Distribution Company Limited
14	Chhattisgarh	G+T+D+H+Tr	2008	Public	Chhattisgarh State Power Distribution Company Ltd.
15	Tamil Nadu	T+(G+D)	2010	Public	Tamil Nadu Generation & Transmission Corporation Limited
16	Punjab	T+(G+D)	2010	Public	Punjab State Power Corporation Limited
17	Himachal Pradesh	T+(G+D)	2010	Public	Himachal Pradesh State Electricity Board

Source: Compiled from PWC report 2012

Note: G-Generation Company; T-Transmission Company; D-Distribution Company; H-Holding Company; TR-Trading Company; (G+D)-Generation & Distribution combined.

1.10 Post Reforms: Initiatives for Private Sector Participation

Involvement of private players in state-owned distribution utilities was initiated with the privatization of distribution in the state of Odisha in 1999. The government of Odisha had initiated the power sector reform in two phases. In the first phase, the Odisha State Electricity Board was unbundled into two government-owned utilities. Odisha Hydro Power Corporation (OHPC) was responsible for hydro power generation and Grid Corporation of Odisha (GRIDCO) was responsible for transmission and distribution functions with full autonomy from 1st April 1996. In the year 1997, the government of Odisha under the company Act, 1956 incorporated NESCO, WESCO and SOUTHCO to take care of Distribution Retail Supply of Electricity. Subsequently, in the year 2002, privatization of Delhi Vidyut happened and was considered to be successful. As a further step towards privatization, distribution franchisee arrangement was adopted. Public Private Partnership (PPP) is a contract that suggests offering a part of license area to an operator for a fixed period through a competitive auction. The bidders are selected on best effective input price for the purchase of power offered. Therefore in the year 2002, distribution franchisee model was initiated after handing over of Bhiwandi to Torrent Power after a competitive bid. It was successful in reducing AT&C losses, reduced transformer failure rates, improved reliability indices and most importantly superior customer satisfaction and service. Post success of distribution franchise model, another initiative was taken in the year 2010, to include Aurangabad and Nagpur, Jalgaon and Shil-Mumbra-Kalwa, and Agra and Kanpur.

In the Distribution sector, most of the SEBs has already unbundled (except for Kerala and Jharkhand). The ownership still largely remains to states. Private Sector Participation is limited to 15 private sector distribution licensees. Out of fifteen utilities, seven utilities operating in Odisha and Delhi were privatized in the year 1999 and 2002 respectively and the other eight were running under the control of private players. Table 1.5 shows states and number of private utilities operating in India.

Table No. 1.5: State and Number of Private Utilities Operating in India

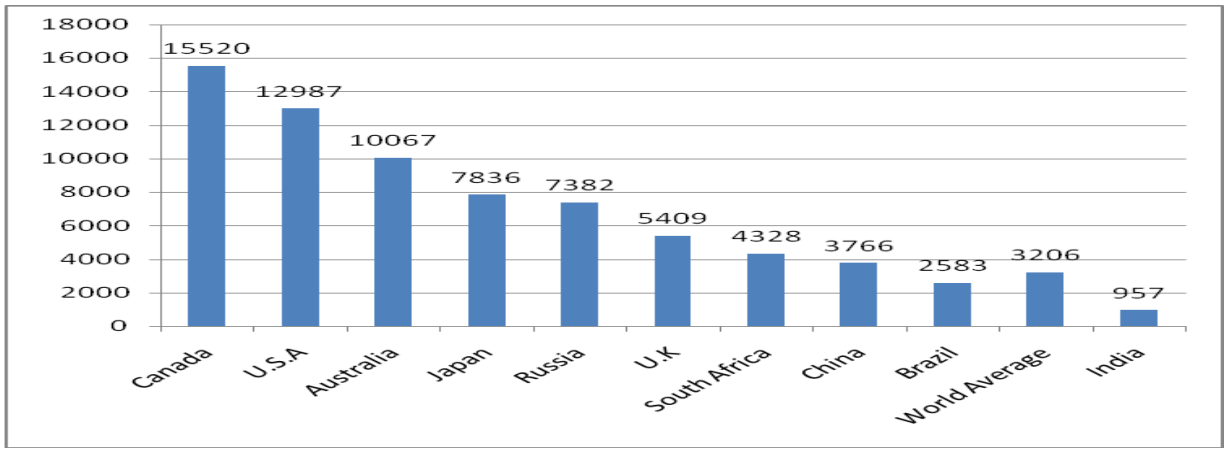
State	No of utilities
Odisha	4
Delhi	3
Gujarat	2
Maharashtra	4
Jharkhand	1
Madhya Pradesh	1
West Bengal	2

Source: Indian Power Sector

1.11 Per Capita Consumption of Electricity Globally

The figure below shows the per capita consumption of electricity which is defined in terms of KWh per capita globally. According to Factly Data (2014), the per capita consumption of electricity in India is 957 Kwh. Further United States of America, Australia and Japan have recorded higher per capita consumption of electricity with 12987, 10067, and 7836 KWh respectively. The low per capita consuming electricity countries are China, Brazil and India with 3766, 2583 and 957 kWh per capita.

Figure No. 1.4: Per Capita Consumption of Electricity Globally in 2013



Source: Retrieved from www.factly.in on 11th May, 2016 Note: India Data is for 2013-14

The Figure 1.4 shows that India has the lowest per capita consumption of electricity among the countries mentioned above. Further, it has the lowest average per capita consumption of electricity among BRIC countries. The world average is recorded at 3206 KWh per capita of consumption of electricity and it is three-fold more than India average consumption. Therefore India has to develop and improve the efficiency of power generation and build power distribution lines for supply of electricity.

Table 1.6 explains country wise ranking as per capita consumption of electricity globally. It can be interpreted that most of the developed countries have the benefit of consuming more electricity as compared to developing and less developed countries. It can also be found that China, Brazil and India which are emerging countries rank 70, 94 and 153 respectively in terms of per capita consumption of electricity.

Table No. 1.6: Global Ranking as Per Consumption of Electricity for the year 2014

Country	U.S.A	Australia	Japan	Russia	U.K	South Africa	China	Brazil	India
Ranking	9	11	30	41	49	60	70	94	153

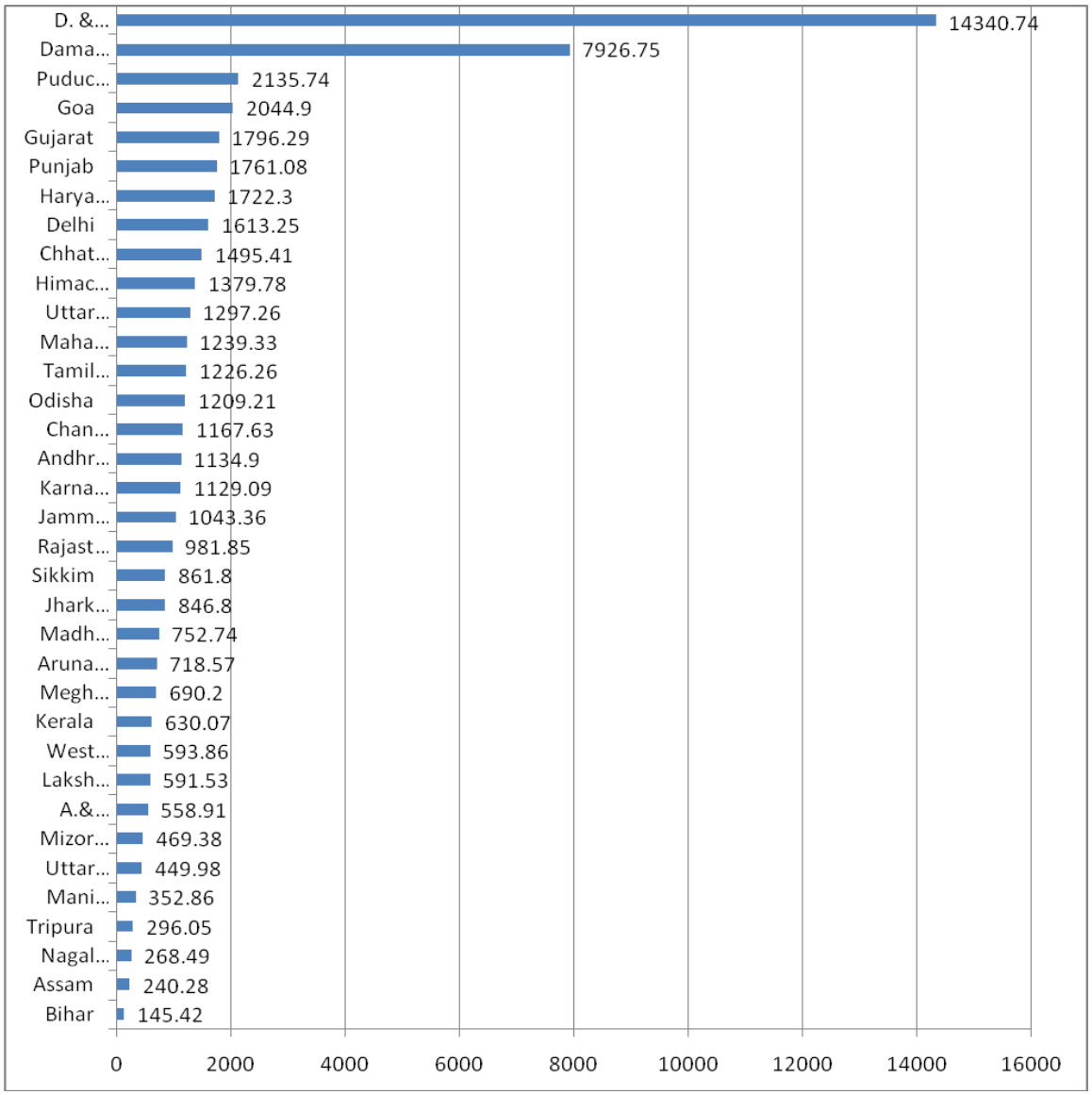
Source: Source: CIA World Factbook - January 1, 2014

1.12 State - Wise Per Capita Electricity Consumption

The highest per capita electricity is consumed by states such as D & N Haveli, and Daman & Diu with 14340 and 7926 respectively. The low per capita electricity consumption of electricity is found in the states of Bihar, Assam, Nagaland, Tripura and Manipur with per capita of 145, 240, 268, 296 and 352 KWh of energy.

The all India average per capita consumption of electricity is 957 KWh. The figure 1.5 shows state wise per capita consumption of electricity for the year 2013.

Figure No. 1.5: States Wise Per Capita Consumption of Electricity for the Year 2013



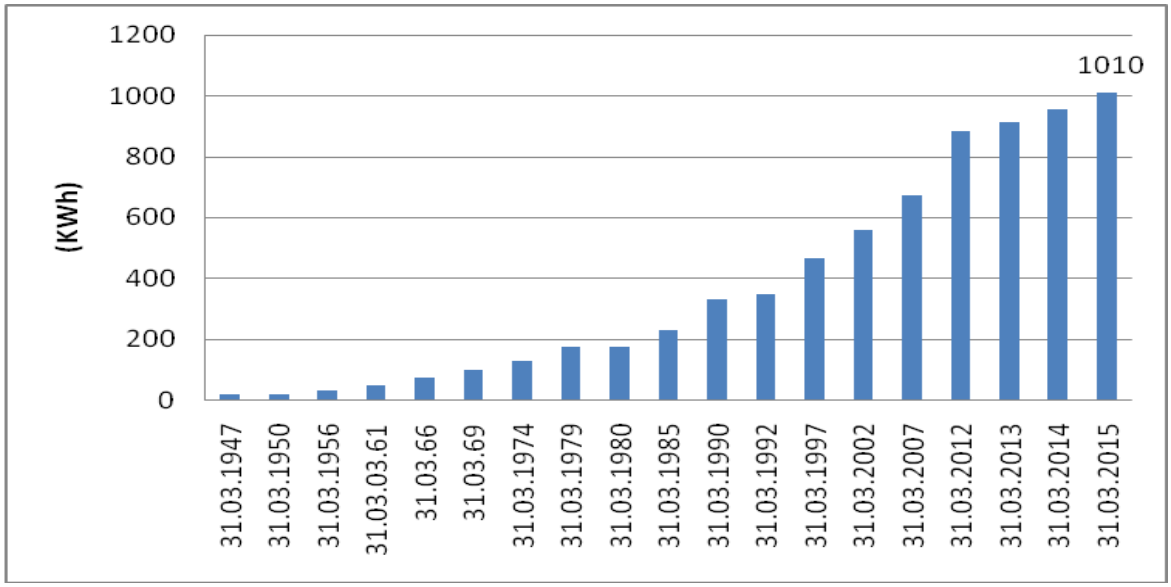
Source: www.factly.in (Available as on MAY 20, 2016)
Per Capita Consumption = (Gross Energy Generation + Net Import)/Mid Year Population. * Provisional

1.13 Per Capita Consumption of Electricity in India

Per capita consumption is the average use of electricity by an individual. It shows the average consumption of electricity by an individual. Since independence, the per capita consumption of electricity has increased gradually till the year 1985. Further, the per capita consumption was recorded as 347.50 kWh in 1990 and later in the year 1997 it

was recorded at 464.60 Kwh. There is a slight improvement in per capita consumption of electricity attained 813.3 kWh per individual.

Figure No. 1.6: Per Capita Consumption of Electricity in India - 1947-2015



Source: Central Electricity Authority (*) Provisional

The Figure 1.6 shows the per capita consumption of electricity of consumers in India. The graph shows that there is a positive growth rate in per capita consumption of electricity. It also depicts that there is a consistent improvement in per capita consumption (Kwh) over the period of 1992-2015. In the year 2015, the per capita consumption of electricity is recorded at 1010 Kwh.

1.14 The Gap between Demand and Supply

"The concept of power distribution utilities operating on a regional basis crossing the political boundaries of states was introduced in the early sixties. In spite of the overall development that has taken place, the power supply industry has been under constant pressure to bridge the gap between supply and Demand" (Central Electricity Authority, 2011). Though the power sector of the state emerged as one of the best performers in India, power generation in the State was insufficient (The economy of Andhra Pradesh 2007-08). The production status of energy in India has not been a match to the power requirements of various categories of consumers.

Table No. 1.7: Surplus /Deficit (In %) of Electricity for the Period of 2007-14

Region /State	2007-08	2008-09	2009-10	2010-11	2011-12	2013-14
Northern region						
Chandigarh	0.0	0.0	-3.0	0.0	-0.3	0.0
Delhi	-0.6	-0.6	-0.8	-0.3	-0.3	-0.03
Haryana	-12.6	-8.5	-4.2	-5.6	-3.6	-2.3
Himachal Pradesh	-3.0	-0.3	-3.9	-3.4	-0.7	-21.9
Jammu Kashmir	-29.0	-24.1	-24.8	-25.0	-23.6	-1.5
Punjab	-8.4	-10.6	-13.8	-6.0	-3.1	-0.3
Rajasthan	-3.1	-1.1	-2.4	-0.9	-3.9	-14.0
Uttar Pradesh	-18.0	-21.5	-21.5	-15.0	-11.3	-3.8
Uttarakhand	-2.9	-1.0	-6.5	-6.0	-2.9	-6.0
Southern region						
Andhra Pradesh	-4.1	-6.8	-6.6	-3.2	-7.2	-6.9
Karnataka	-2.7	-6.0	-7.7	-7.6	-11.2	-9.5
Kerala	-2.4	-11.8	-2.4	-1.4	-2.1	-2.4
Tamil Nadu	-2.8	-7.8	-6.2	-6.5	-10.5	-5.9
Pondicherry	0.0	-12.2	-6.8	-4.0	-1.4	-1.0
Western Region						
Chhattisgarh	-4.8	-2.6	-2.5	-1.7	-2.7	-0.7
Gujarat	-16.2	-9.8	-4.5	-5.7	-0.4	0.0
Madhya Pradesh	-14.1	-17.2	-19	-20.2	-16.9	-0.1
Maharashtra	-18.3	-21.4	-18.7	-16.6	-16.9	-2.1
Goa	-1.2	-12.3	-6.8	-8.4	-10.6	-0.5
Daman & Diu	-10.9	-3.3	-3.8	-0.1	-0.7	0.0
Dadra & Nagar Haveli	-0.5	-1.7	-2.1	-2.1	-1.4	0.0
Eastern Region						
Bihar	-13.3	-16.4	-14.4	-13.0	-21.3	-4.1
Jharkhand	-13.3	-4.7	-7.8	-3.4	-4.0	-1.9
Odisha	-1.8	-1.5	-0.9	-0.3	-1.5	-1.7
West Bengal	-6.5	-5.4	-6.9	-10.9	-4.8	-0.3
Sikkim	-6.0	-22.0	-11.1	0.0	-1.5	0.0

Source: Load Generation Balance Report, Central Electricity Authority, Government of India.

There is a constant widening of the gap between power generation and demand for power in India. Few states have abundant natural resources for power generation. In spite, self-sufficiency in it is yet to be realized. The power consumption of people in the state is much above the average per capita consumption in the rest of the country. The production efforts in the power sector have not been increasing correspondingly and positively for enhancing the consumption levels of people and their standard of living.

There is a constant widening of the gap between power generation and demand for power (Dasaraju and Murthy, 2011).

The Table 1.7 shows the power supply position of different States in India for the period of 2007-14. It shows the region wise position of power supply and it is expressed in the form of surplus/Deficit in terms of percentage.

In the northern region, Jammu Kashmir has a highest deficit of electricity and the lowest deficit is recorded by Chandigarh. Except for Himachal Pradesh, all other northern states have decreased the gap between demand and supply.

In the southern region, the highest deficit is recorded by Tamil Nadu and the lowest by Pondicherry. Karnataka has increased the gap between demand and supply of electricity between 2007-14, while Pondicherry has been able to meet its demands.

In the western region, Gujarat has improved its energy deficit of -16.2% to 0.0 % from 2007-14 while Maharashtra and Madhya Pradesh has deteriorated in their performance.

In the eastern region, Odisha is the best performer and Bihar has recorded the worst performance. Except for Bihar, all other eastern states have reduced the gap between demand and supply.

There is a need for government intervention to increase competition in this sector and to permit more participants in order to provide electricity to meet the increasing demands.

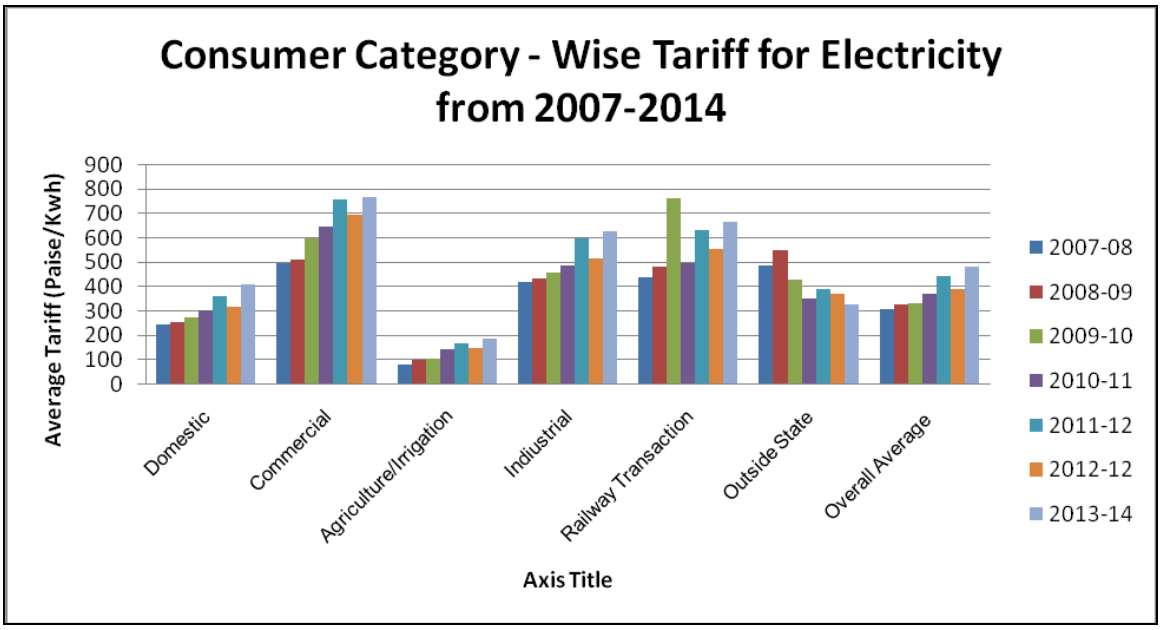
1.15 Consumer Category - Wise Tariff of Electricity

Consumers are classified according to purpose and usage of electricity and further tariff is fixed for each category of consumer thereof. According to the Planning Commission Report 2014, “The overall average tariff rates in India have increased from 306 paise / kWh to 480 paise / kWh; and in terms of percentage it has increased by 56.86 percent for the period of 2007-14.”

The maximum increase can be found in agriculture/irrigation category, where the tariff increased by 134.6 percent, followed by a commercial segment that observed an increase of 154.65 percent from 2007-08 to 2013-14. The only category of consumer that experienced a decline in the tariff rate was outside state segment, where tariff decreased by 32 percent in 2013 when compared 2007-08.

The Figure 1.7 shows that except outside state category of consumers, all other categories of consumers' tariff rate has increased from 2007-08 to 2013-14. The agricultural consumers have the lowest tariff rates followed by domestic consumers from the year 2007-08 to 2013-14. The reason behind the low tariff rate to a certain set of consumers is that the government provides subsidy.

Figure No. 1.7: Consumer Wise Tariff For Electricity (2007-2014)



Source: Planning Commission Annual Report 2013-14.

1.16 Problems in Power Distribution Utilities in India

Indian power sector has always been in turmoil. The distribution utilities have managed to overcome the problems to a certain extent but still there are issues which have to be tackled to improve the current position. The main problems due to which the distribution utilities are not able to perform better are as follows:

1.16.1 Irregularities in Payments Made by Government Owned Bodies

There are irregularities in payments made by state government owned utilities, Urban Local Bodies (ULB's) and Public Sector Undertakings (PSUs). All these irregularities impact the commercial viability of power distribution utilities and in turn, affect the financial performance. In the case of Odisha, electricity dues amounting to Rs 414.88 crores are pending as on 29th February, 2012.

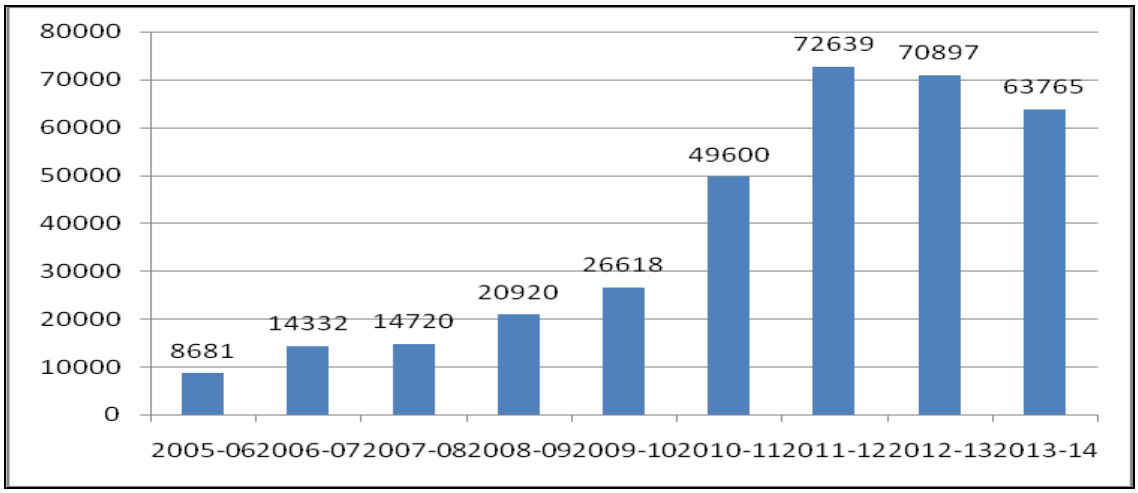
1.16.2 Poor Financial Status and Low Creditworthiness

The poor financial status and operational efficiency of SEBs / state utilities are imposing a heavy burden on the economic resources of the respective state governments. On the financial side, the lack of expenditure prudence and skewed tariff structure has led to a deterioration of the financial health of state utilities. The increasing aggregate losses over the years have deteriorated the financial condition of distribution utilities in India.

According to Crisil Report on Indian Power Distribution Utilities, the financial losses of the sector have grown at a Compound Annual Growth Rate (CAGR) of 24% in the last four years and are expected to be more than Rs. 40,000 crores approximately in 2010-11. Further, the aggregate debt of discoms grew at a compounded annual rate of about 20% in the last four years moving to a high of Rs. 4,40000 Crore on 31st March 2015. These losses have been funded largely by short-term loans from banks/financial institutions, and discoms with their weak financial position seem incapable of repaying these loans.

The aggregate book losses of utilities selling directly to consumers increased from Rs.8681, 20920, 63765 for the year 2005-06, 2008-09, 2013-14 respectively . There is a steep increase in aggregate losses from 8681 in 2005-06 to 72639 in 2011-12. Further, the aggregate book losses decreased for the next two years. The figure 1.8 shows aggregate basic losses.

Figure No. 1.8: Aggregate Book Losses for the Period of 2004 - 2014



Source: Power Finance Corporation Ltd, 2014

1.16.3 Increasing Gap between Average Tariff and Revenue Realization

These losses refer to the difference between units input into the system and the units for which the payment is collected. According to the planning commission, Eleventh plan, "The AT&C losses are presently in the range of 18% to 62% in various States." The average AT&C loss in the country is about 40%. There is a wide variation of losses among the States and variation among the distribution companies within the States. The major portion of losses is due to theft and pilferage, which is estimated at about Rs 20000 crore annually. As per the *Economic Survey 2006–07*, more than 75%–80% of the total technical loss and almost the entire commercial loss occur at the distribution stage.

The aggregate technical and commercial (AT&C) losses have been increasing in the state utilities. The Table 1.8 shows the AT&C region wise for the period of 2007-2014. The eastern region has high AT&C losses and the southern region has the lowest AT&C losses, the national average ranges from 26.15 to 29.58 % in 2007 to 2014 respectively. According to Schramm (1993), any power system will incur technical losses in transmission and distribution losses but generally range between 7% and 10%. Therefore the distribution utilities in India have to improve efficiency to match the global standard.

Table No. 1.8: AT&C Region Wise for the Period of 2007-14

Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Eastern	37.76	35.51	33.94	38.24	42.61	42.04	38.02
Northern-Eastern	40.06	35.96	36.23	37.33	34.85	38.31	33.94
Northern	33.28	31.19	29.66	28.91	31.49	28.89	24.86
Southern	20.27	17.42	19.05	19.26	18.62	17.40	19.08
Western	31.83	34.32	28.02	24.44	24.86	23.36	18.37
National	29.58	28.44	26.58	26.15	27	25.45	22.70

Source: Compiled from PFC Reports, 2015

1.16.4 Increasing Gap between Average Cost of Supply (ACS) and Average Revenue Realized (ARR)

The increasing gap between the average cost of supply and average revenue realization of electricity is an important driver for increasing losses in the distribution company. For example, in the case of Odisha average gap between revenue generation and revenue need of DISCOM is Rs 437.53crore, average T&D loss 57%, billing 65% in 2005-06, collection to billing 74% in 2005-06. Thus, efficiency has not been achieved as per the expectation.

Table No.1.9: Gap for Unbundled States (Rs. /Kwh)
(For utilities selling directly to consumers)

	2007	2008	2009	2010	2011	2012	2013	2014
ACS	2.64	2.29	3.42	3.51	3.97	4.36	5.04	5.15
Avg. Revenue without subsidy	2.26	2.41	2.67	2.76	3.09	3.36	3.76	4.0
Gap (without subsidy)	0.39	0.48	0.75	0.74	0.88	1.00	1.27	1.15
Gap (subsidy booked basis	0.14	0.16	0.25	0.22	0.57	0.64	0.84	0.73
Gap (subsidy received basis)	0.16	0.23	0.46	0.50	0.60	0.70	0.85	0.73
Gap (subsidy / revenue on realized basis.	0.25	0.30	0.62	0.67	0.84	1.04	0.54	0.81

Source: PFC Reports: Performance of State Power Utilities for the years 2006-07 to 2012-14, 2015

The Table No.1.9 depicts State Wise Gap for Unbundled States (Rs. /Kwh) for utilities selling directly to consumers for the period of 2007 to 2014. The national average cost and average revenue without subsidy have increased from Rs.2.64 per kWh to Rs. 5.15/Kwh and Rs. 2.26 per Kwh to Rs. 4.0 per kWh respectively. Further, the gap (subsidy /revenue on realized basis) have also increased from 0.25 to 0.81, indicating 3 fold increase during 2007 to 2014.

1.16.5 Subsidy

The state government interventions in tariff setting without proper subsidiary to SEB's have been a major drawback. The state government desires to provide power supply at concessional rate to certain set of consumers especially, agriculture have affected the profitability of the power sector. According to Singh (2007), "State Governments provide additional subsidy support to a particular section of the politically sensitive class of consumers to avoid tariff hikes. This translates into additional borrowing for the state governments or diversion of funds from other socially desirable sectors. In some cases, regulators have resorted to the creation of a 'regulatory asset', which postpones tariff hike for future tariff reviews".

1.16.6 Inability to Raise Funds for Short Term and Long Term Use

Investments are required to support existing Distribution infrastructure in order to improve reliable, consistent, strong distribution network in both urban and rural areas. Hence there is a need to raise funds to complement increase in generation and transmission infrastructure capacities.

The poor financial condition of discoms has become increasingly difficult to pay their debts. Therefore the banking sector and most lenders became very cautious in extending loans to the power sector as a whole. The Ministry of Finance also directed the banks to stop providing working capital finance to utilities that have large losses. Further the other lending institutions such as ADB, World Bank are also finding it difficult to extend loan due to the poor credibility of power distribution utilities.

Therefore India is making progress in their efforts to induce private investment in the power sector. However, improving growth prospects in domestic markets may encourage international project promoters to look inward to their own domestic markets unless lucrative returns are forthcoming under an appropriate investment climate.

1.17 Rural Electrification

Rural electrification is the process of providing electricity to rural and remote areas such as villages or hamlets. A village is considered electrified, if at least 10 percent of all households in a village and other public spaces such as schools, panchayat officers, health centers, community centers and dispensaries are provided access to electricity.

The Table 1.10 shows the progress report of village electrification. It gives information about the total inhabited villages, villages electrified (in numbers), cumulative achievement, percentage of village electrified and un-electrified villages of all the states and union territories in India.

The Table 1.11 shows the status of rural electrification in India. Only eight states so far have achieved 100 percent rural electrification and mostly belong to the southern region of India.

It is found that fifteen states have recorded 90-99% rural electrification and four states have reached 81-90% rural electrification. The remaining five states namely Arunachal Pradesh, Nagaland, Odisha, Tripura have the lowest rural electrification among all the states. There is a need to fasten the pace of rural electrification in those states.

Table No. 1.10: Progress Report of Village Electrification for the Period of 2014

Sl. No.	States/UTs	Total inhabited villages as per 2011 census	Villages electrified as on 31-03-2014 (Provisional)(#)		Cumulative achievement as on 30- 11-2014	%age of villages electrified as on 30-11-2014	Un-electrified villages as on 30-11-2014
			Numbers	%age			
1	Andhra	26286	26286	100.0	26286	100.0	0
2	Arunachal	5258	3586	68.2	3645	69.3	1613
3	Assam	25372	24404	96.2	24549	96.8	823
4	Bihar	39073	37002	94.7	37316	95.5	1757
5	Chattisgarh	19567	19055	97.4	19116	97.7	451
6	Goa	320	320	100.0	320	100.0	0
7	Gujarat	17843	17843	100.0	17843	100.0	0
8	Haryana	6642	6642	100.0	6642	100.0	0
9	Himachal	17882	17880	99.99	17880	99.9	2
10	J & K	6337	6224	98.2	6224	98.2	113
11	Jharkhand	29492	27164	92.1	27213	92.3	2279
12	Karnataka	27397	27363	99.88	27363	99.9	34
13	Kerala	1017	1017	100.0	1017	100.0	0
14	Madhya	51929	50381	97.0	50453	97.2	1476
15	Maharashtra	40956	40920	99.9	40920	99.9	36
16	Manipur	2379	2061	86.6	2061	86.6	318
17	Meghalaya	6459	5132	79.5	5167	80.0	1292
18	Mizoram	704	596	84.7	636	90.3	68
19	Nagaland	1400	1261	90.1	1260	90.1	139
20	Odisha	47644	38920	81.6	38927	81.6	8750
21	Punjab	12168	12168	100	12168	100.0	0
22	Rajasthan	43264	39036	90.2	39058	90.3	4206
23	Sikkim	425	425	100.0	425	100.0	0
24	Tamil Nadu	15049	15049	100.0	15049	100.0	0
25	Tripura	863	837	97.0	837	97.0	26
26	Uttar Pradesh	97813	96515	98.7	96515	98.7	1298
27	Uttarakhand	15745	15638	99.3	15638	99.3	107
28	West Bengal	37463	37461	99.99	37461	99.9	2
	Total(States)	596780	571186	95.7	571990	95.8	24945

Source: TERI Energy and Environment Data Diary and Yearbook (TEDDY) 2014/15

Table No. 1.11: Status of Rural Electrification in India

S.No.	% of Villages Electrified	Total Number of States	Names of States
1	100%	8	Andhra Pradesh, Goa, Gujarat, Haryana, Kerala, Punjab, Sikkim and Tamil Nadu
2	90-99%	15	Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Jharkhand, Karnataka, Chhattisgarh, Maharashtra, Nagaland, Tripura, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal
3	81-90%	4	Manipur, Meghalaya, Odisha, Mizoram.
4	71-80%	4	Arunachal Pradesh, Meghalaya

Source: Central Electricity Authority

As per Planning Commission - Eleventh plan, rural distribution segment is characterized by wide dispersal of network over large areas with long lines, low demand density, high cost of supply, low paying capacity of the people, large number of subsidized customers, unmetered flat rate supply to farmers, non-metering due to high cost and practical difficulties, low load and low rate of load growth.

1.18 Conclusion

Power sector reforms have helped India to liberalize the power sector which was predominantly dominated by state electric board. The power sector has recorded an immense growth rate but when compared with the developed countries of the world, it has to go a long way in achieve the global standards. The gap between demand and supply has been growing due to increase in population leading to more demand. A high proportion of electricity is consumed by the agricultural sector, but it only contributes a small portion of revenue to the power sector leading to increasing in the margin of cost and revenue. The T&D losses are very high compared with global averages which can be averted to avoid unnecessary losses. The poor ability of the state electric boards to collect receivables from the customers has even more deteriorated the financial condition of the

power utilities. Lastly due to their low financial credibility, power sector has not been able to pull investment from both domestic and international private investors.

1.19 Suggestions

- Avoid political intervention in tariff revision to endorse a sensitive class of consumers.
- Tariff hike should not be postponed and if required tariff revision should be carried out whenever required.
- Debt restructuring to control the worsening financial condition of utilities.
- Precautionary measures should be taken to avoid power theft, non-billing, incorrect billing, reduce transmission and distribution losses.
- Exploration of alternate energy sources at rural areas.

CHAPTER- II

LITERATURE REVIEW

2.1 Introduction

Working capital management is an integral part of financial management. From a research point of view, a large volume of literature is available on working capital management in India and abroad. Despite considerable literature, the present study found that research has mostly focused on manufacturing industries, ignoring other sectors such as service industries. Very little research is available on service industries such as power sector and that to have focused on technical aspects of power distribution utilities. Therefore it is very important to understand the "Composition of each working capital variable and in-depth understanding of historical trends, patterns and relationship" (D'Attilo, 1992) and the impact of working capital variables on the profitability of companies. There are a few studies on working capital management which has been highlighted in the specific study.

2.2 Determinants of Working Capital Management

Chiou, Cheng, and Wu (2006) attempted to find the determinants of working capital management such as business indicators, industry effect, debt ratio, growth opportunity, operating cash flows, firm's performance and firm size. Ordinary least square was used to examine the impact of these variables. A sample of 19,180 listed companies in Taiwan was selected for the study. The study was based on 35 quarters of data, i.e., from the first quarter of 1996 to third quarter of 2004. Variables such as net liquid balance and working capital requirements are adopted from Shulman and Cox (1986) as proxies for working capital management. The study found that debt ratio and operating cash flows affect the company's working capital management. Further the study did not find any consistent relationship between working capital management and business indicators, industry effect, company growth, firm's performance and firm's size.

Zariyawati (2010) determined the working capital management of listed firms in Malaysia for a period of 2000-2006. Cash conversion cycle has been used as a proxy for working capital management. The study found that firm size, growth opportunity, economic growth and inflation are associated with working capital management. The study suggested that managers should consider both firms specific factors and macroeconomic factors to establish optimal working capital management.

Al Taleb, Zoued, and AL-Shubiri (2010) attempted to identify the determinants of effective working capital management policy in Jordon firms. The study used a sample of 82 industrial firms listed at Amman Stock Exchange (ASE) for the period of 2005 to 2007. The financial data was obtained from the annual reports of firms, and data regarding economic variables was used from an economic survey of Amman published by the Ministry of Finance. The simple and multiple regression analysis indicated a statistically significant relationship between the working capital and operating cash flow deflated by total assets, sales growth, return on assets, Tobin's q and leverage in most period of the study. Further results revealed a statistically significant relationship between all independent variables and working capital during the entire sample period. The study emphasizes the role of board members in monitoring management and management's compensation in its control of the firm's working capital.

2.3 Working Capital Financing

Working capital financing is a critical task as it requires procuring funds from different agencies or institutions to fulfill the working capital needs of firms. Therefore the policies of firms differ from one another due to the differences in type and size of firms. Some of the research works which highlight the working capital financing are:

Cheatham, Dunn and Cheatham (1989) stated that small business firms rely heavily on short-term sources of financing such as accounts payable, accruals and line of credit.

Hossain and Akon (1997) in a research have emphasized on the financing of working capital in reference to Bangladesh Textiles Mills Corporation. A Sample of 40

public sector textile units was selected in Bangladesh over the period of 1982 to 1993. It was found that the sample units were exploiting the entire short-term sources available and a large amount of short-term funds were used for financing fixed assets. Further statistical analysis revealed a perfect positive correlation between short-term bank credit and current liabilities. Trade credit and current liabilities have negatively correlated and an insignificant negative correlation existed between current liabilities and tax provision. The study suggested that the sample units should examine the current aggressive working capital policy to avoid unwarranted reliance on short-term funds.

Sathyamoorthi (2002) studied the working capital management of selected co-operatives in Botswana for the period of 1994-1997. The study attempted to ascertain how the current assets were financed and to discover the relative importance of various current asset components. Ratio such as current ratio and liquid ratio are used to ascertain liquidity. Simple statistical tools such as standard deviation and coefficient of variations were used. The results indicated that 45% of the current assets were locked in stock due to which liquidity position of the cooperatives was effected. The cooperatives also adopted a conservative financing policy for financing current assets in most of the cases. They used long term funds to discharge its current liabilities. The study also found that investment in current assets varied from one year to another.

Nazir and Afza (2009) investigated the impact of aggressive working capital policy and financing policies on profitability with a selected sample of 204 non-manufacturing firms from 17 different sectors for a period of 8 years i.e. 1998 to 2005. The asset investment policy, aggressive investment policy and aggressive financing policy were used to measure the degree of aggressiveness of financing policy, working capital investment policy and working capital financing policy respectively. Return on asset and market valuable of a company assets were used to show the impact of working capital policies on profitability and market measures of profitability. The statistical tools such as panel data regression model were used to know the impact of aggressive and conservative working capital policies on firm's profitability. The study found that there is a negative relationship between the firm's profitability measures and degree of aggressiveness of working capital investment and financial policies. Further, it was found

that investors are giving more value to those firms which are more aggressive in managing their current liabilities.

Shah, Amjad, Hasnu, and Shah (2010) attempted to determine working capital financing approach followed by small and medium-sized industrial companies in Pakistan. The study selected a sample size of 15 units of small and medium-sized industrial companies over the period of 2002 to 2004. Accounting tools such as current ratio, inventory turnover ratio, receivable turnover ratio, debtor's collection period, accounts payable period and creditor payment period were employed. The study found that small and medium enterprises (SME) are following a conservative approach to financing current assets. SMEs prefer to avail long term loans instead of short term loans because the management lacks knowledge and professionalism. Due to lack of credibility to repay short-term loans on time, the firms rely on equity to finance the short term requirement of funds. The study suggested that accelerating collections, utilization of available funds to optimal levels and proper management of cash will improve the performance of small and medium scale.

2.4 Cash Management

The main objective of cash management is to maintain liquidity, improve revenue, accelerate cash flows, reduce costs and thereby improve efficiency to sustain growth and development of the organizations. Over the years many researchers have studied the importance of cash management, cash conversion cycle, cash flows in business and its effect, efficiency, the impact of cash management on profitability. Some of the previous studies are highlighted in this section.

Leo R. Cheatham (1989) attempted to explain the cash conversion cycle as an ideal framework for determining the actual amount of cash needed by the small firms to finance working capital. The study found that the small business firms which do not analyze cash flows face bankruptcy in spite of the business running in profits. The small firms rely heavily on short-term sources of financing such as accounts payable, accruals and line of credit. The author suggested that the small scale firms maintain its own

database of working capital, so that it can forecast the level of cash investment in inventories and accounts receivable accurately to run the business smoothly.

D'Attilo (1992), in his research have attempted to forecast the change in net working capital and it affects on corporate cash flows at DuPont. The author opined that net income is more volatile and thus difficult to project. Therefore it is very important to understand the composition of each working capital variable and in-depth understanding of historical trends, patterns and relationship is necessary. The study found that the firm has experienced large errors of elements in net working capital from time to time. The author suggested that a statistical method with judgmental will improves the quality of forecast.

Quirin, O'Bryan, Wilcox, and Berry (1999) examined the actual cash flow from operations using four predictors (actual cash flows from operation, working capital from operations, net income before extraordinary items and discounted operations and net income plus depreciation and amortization) for the period 1989 to 1996. A sample of 1442 firms was selected for the study and sample observations were collected from 1997 version of Compustat PC plus. Statistical tools such as mean, standard deviation and simple ordinary least square regression were used. The empirical results indicated that actual cash flow from operation was the best predictor in five out of eight years with less year to year variability than the competing model followed by working capital operations, net income plus depreciation and amortization. The lowest predictor in all eight years was net income before extraordinary items. The study concluded that the findings cannot be generalized over a longer period of time.

Farris II and Hutchison (2003) attempted to measure cash-to-cash performance for a sample of 5884 companies over the period of 1986 to 2001. The study found that the firms have reduced cash-to-cash cycle from 98.3 days to 72.4 days during the period of the study. The inventory level and account receivable period has dropped and accounts payable period has decreased in 25 out of 30 industries. The variation is witnessed due to the advancement in technology, communication and logistics. The author suggested that

managers can follow an approach which would be unique combination of all the three variables of working capital that will lead to optimal cash to cash cycle.

Ajmera and Bhatt (2011) made an attempt to study the cash management of 6 selected Indian refineries for the period of six years from 2003 to 2008. Accounting ratios such as cash position, net cash flow to current liabilities, cash to current asset ratio and cash turnover ratio and cash to sales ratio were used. The first two ratios are used to know the adequacy of cash in the sample firms. The last three ratios are used to know how well cash is used to optimize profits. The current ratio indicated that all units had inadequate cash balances to meet the current obligations. The net cash flows to current liabilities indicate that all the units were not holding sufficient cash balances to fulfill current obligations. Cash turnover ratio indicated that firms did not had enough cash for operational requirements. The paper concluded that all the sample units had inadequate cash balances to meet their current maturing obligations; therefore it is necessary to ensure that the cash balance is managed at optimal levels. Further inadequate cash levels have always an impact on the solvency of the respective units, therefore proper management of cash is required to avoid the firms moving into insolvency or bankruptcy.

Kadam and Laturkar (2011) felt that proper cash management permeates entrepreneurs to adequately meet their cash demands of their businesses, avoid unnecessarily large cash balances and stretching the profit-generating power of each credit or dollar of their own companies.

2.5 Receivables Management

Receivable management plays an important role in maintaining credit policy and controlling excess credit and further acts as a watchdog on bad debts. There are few studies on receivable management which are:

According to Seiden (1964), cash discount prevents debtors from using trade credit as a source of working Capital. The cash discounts can be used to maintain adequate levels of liquidity in the firm.

Mishra (1975) opined that "A collection policy should always emphasize promptness, regularity and systematization in collection efforts."

Jajuga (1994) states that "The portfolio approach to accounts receivable management can be used by utilizing the rate of profit (rate of advantage from assets) as one of the basic criteria that the firm giving the trade credit should encourage the purchaser to consider when making decisions."

Rafuse (1996) emphasized on the strategies to reduce the cost of working capital management in U.K small and medium enterprises (SMEs). It is found that most of the SMEs in U.K receive late payments due to which the cost of collecting these funds is moderately high which results in business failures. Further the cost to fund the debtors and creditors is relatively high and it's impractical to reduce these costs for the sake of business survival. The study suggested that the firms should collect payments from debtors as early as possible to decrease the cost to fund the debtors and to sustain smooth running of business.

Ramudu and Rao (2007) attempted to study receivables management of Indian Commercial Vehicles Industry. It was found that industry had managed receivables efficiently but few individual companies were far less satisfactory compared to the industry score.

Michalski (2007) attempted to show the consequences that can result from operating risk that is related to the purchaser using payment postponement for goods and/or services. Further, the article proposed a method that uses portfolio management theory to determine the level of accounts receivable in a firm. The study found that an increase in the level of accounts receivables in a firm increases both net working capital and the costs of holding and managing accounts receivable leading to decrease in the value of the firm, whereas a liberal policy in accounts receivable coupled with the portfolio management approach could increase the value of the firm.

2.6 Comparative Study on Working Capital

Joshi, Joshi, and Gairola (2010) conducted a comparative case study between working capital management of public sector and private sector enterprises. The discussion is based on comparative case studies of TISCO and RINL for a period of 4 years i.e., 2005-2008. It was found that RINL was following a conservative working capital policy, cash generating capacity through operating activities declined, no payments of dividends was observed for sample period i.e., no cash flows, inefficiency in material handling, advantage of obtaining raw material from its own subsidiary company, conservative credit policy whereas TISCO was found relatively liquidity, undergone acquisition, dividend paid regularly, efficient in material handling, high composition of debtors to total assets. The author concluded that the sensitivity to changes in current assets and efficiency of working capital to generate sales make a significant difference in the management of working capital in both sectors.

2.7 Relationship and Impact of Working Capital on Profitability

Vijayakumar and Venkatachalam (1996) attempted to explain the trend, association and performance of profitability and working capital management. The study is a case study on Tamil Nadu Sugar Corporation for the period of 1985-1986 to 1993-1994. The statistical techniques such as correlation analysis and multiple regressions were used to explain the interdependence and influence of working capital variables on profitability. The study found that on an average inventory, loans and advance contribute two-third of the gross working capital. Further correlation analysis showed that liquid ratio, working turnover ratio, inventory turnover ratio and receivables turnover ratio have shown positive correlation; whereas current ratio, cash turnover ratio and working capital / total assets have shown a negative correlation with profitability ratio respectively. The liquidity position of TASCO was found satisfactory during the study period. The multiple regression analysis inferred that due to excess current assets, the profitability of TASCO was adversely affected. The study suggested that the optional level of working capital should be maintained and ensured that a positive trend in the estimation and maintenance of the working capital should be ensured.

Strischek (2001) emphasized on the banker's perspective on working capital and cash flow management. The lenders look into three keys areas: sound collection practices, inventory controls and trade credit discipline. The banker looks into three basic conditions – purpose, repayment ability and structure. Among the three, repayment ability of a firm is considered as most important because the lender assesses cash flow evaluation from operations. To measure the appropriateness of working capital of a firm, it was compared with the industry average. It was found that the firm maintains half the cash as compared to industry, which reflects the firm's efficient cash flows or illiquidity reliability to get as much sales per dollar of working capital. The firm has tied up too much cash in its receivables and inventory relative to peer industry, due to which the cash balance was lower than average.

Shukla (2002) focused on the state of working capital management in 8 cotton textile units for the period of 1977-78 to 1986-87. The study found bank credit is the most common source of working capital. Further, inventory levels are excessive due to which the sample firms Profitability and liquidity are directly influenced. The collection policy is liberal in almost all the units and the cash flows are not efficiently managed. The correlation analysis shows that there exists a moderate positive correlation between cash holding and output and sales. The liquidity position is poor for most of the firms and profitability is low or negative in most of the firms. The study suggested that managers should focus on profitability as well as liquidity and the over-investment in inventories and account receivable should be avoided to improve efficiency.

Deloof (2003), in an empirical study, attempted to explain the relationship between working capital management and profitability for a sample of 1009 large non-financial Belgian firms between the period of 1922 to 1996. Statistical tools such as correlation analysis and regression analysis were used to investigate the relationship and impact of working capital management on corporate profitability. The author found that there exists a significant negative relationship between gross operating income and the number of day's accounts receivable, number of day's inventories and number of days account payable of Belgian firms. This implies that an increase in the number of days of above variables will decrease the gross operating income of the firm. The managers are

suggested to create value for their shareholders by reducing the number of days account receivable and inventories to a reasonable minimum.

Bhayani (2004) made efforts to know the impact of working capital and profitability of Gujarat Ambuja Cement Ltd, during the period 1993 to 2003. The study found that there is a negative correlation between current ratio, acid test ratio, current ratio to total assets ratio, current assets to sales ratio, working capital turnover ratio, debtor's turnover ratio, and cash turnover ratio with the profitability ratio. The inventory Turnover ratio and miscellaneous current assets turnover ratio witnessed a positive correlation with the profitability ratio. Further current ratio to total assets ratio, cash turnover ratio and working capital turnover ratio showed a negative influence on profitability whereas inventory turnover ratio and debtor's turnover ratio showed a significant increment in the profitability of the company. The study concluded that the increase in the profitability of the company was less than the proportion decrease in working capital.

Narware (2004) made an attempt to empirically assess the impact of working capital on its profitability of National Fertilizer Ltd for the period of 1990 to 2000. Statistical tools such as coefficient of correlation and regression were used to examine the impact of working capital on profitability. It is found that current assets to sales ratio, working capital turnover ratio and debtor's turnover ratio has a negative correlation with return on investment whereas working capital ratio, acid-test ratio, current assets to total assets ratio, inventory turnover ratio, cash turnover ratio and miscellaneous current assets ratio has a lower degree of positive correlation. The author concluded that increase in the profitability of the company was less than the proportion decrease in working capital.

Mukhopadhyay (2004) in a research study have attempt to understand the effectiveness of working capital management practices and the problems faced by MS Heavy engineering company during a period of ten years i.e. from 1993-94 to 2002-2003. The study is based on secondary and primary data. The author found that the firm suffers from an acute crisis of working capital and there exists a negative working capital throughout the study period. It is suggested that company may make a revaluation of real

estate including land and other assets and make a valuation of goodwill and disposal of idle assets and sell a certain percentage of company goodwill to infuse fresh blood in the form of working capital to run the business. It is suggested that non-finance professional should not interfere in financial management practice of the company for smooth and efficiently running the business.

Filbeck and krueger (2005), in a research study, attempted to analyze the working capital management results across industries for a period of 4 years i.e. 1996-2000. The sample is based on the annual ratings of working capital management published in CFO magazine. The study found that there is a significant difference between industries in working capital management across time and the measures for working capital change significantly within industries across time. The changes in working capital management may be due to the macroeconomic factors such as change in interest charges, rate of innovation and competition.

Hamsalakshmi and Manicham (2005) in their study examined the structure of Liquidity position, Leverage position and profitability position of selected firms. The study is based on a sample of 34 software companies in India quoted at BSE for a period of 1997 to 2001. Statistical tools such as correlation analysis and multiple regression analysis were used to explain the relationship between dependent variable and each independent variable. The sample firms followed a conservative financing policy. The study found that the liquidity position and working capital are favourable for the study period. The return on investment and return on equity proved that the overall profitability position of the selected firms have been increasing at a moderate rate.

Lazaridis and Tryfonidis (2006) investigated the relationship between corporate profitability and working capital management based on a sample of 131 companies listed on Athens stock exchange. The study was confined for the period of 2001-2004. Regression analysis was used to know the relationship between profitability and working capital management. The results indicated that there is a statistically significant relationship between profitability (measured through gross operating profit) and the cash conversion cycle. The author suggested that managers can create shareholders value by

handling accurate cash conversion cycle/period and keeping each component of working capital such as accounts receivables, accounts payables, inventory to an optimum level.

Shah and Sana (2006) conducted an empirical study to know the impact of working capital management on the profitability of oil and gas sector in Pakistan. The sample consists of 7 oil and gas companies listed on the Karachi stock exchange in Pakistan. The time period for the study is five years i.e., from 2000-2005. The study found a negative relationship between gross profit margin and number of day's accounts receivable, number of day's inventory, cash conversion cycle and sales growth. Number of day's accounts payable and gross profit margin showed a positive relationship between the two. The regression analysis showed a joint effect of all coefficient is significant which means working capital management effects profitability of a firm. The sales growth showed a negative correlation with profitability. It indicates that companies make high investment to achieve higher sales, leading to reduces in profit. The study concluded that the shorter cash cycle would be a sign of good management of working capital management.

Padachi (2006), in a research study, attempted to understand the trends in working capital management and its impact on firm's performance of Mauritian small manufacturing firms for a period of 6 years i.e. from 1998-2003.The author emphasized on the impact of account receivable in days, inventory in days, account payable in days and cash conversion cycle on return on total assets. Further, the study analyzed the trend in working capital needs of firms and examined the causes for any significant differences between the industries. A sample of 58 small manufacturing firms was used from 5 different Industries. The study revealed that there is a variation in various components of working capital in different industries. The correlation analysis indicated that the period of cash conversion cycle is more and leading to increased sales, especially where the cost of tied up capital is lower than the benefits of holding more inventories and granting more trade credit to customers. At last, it was also found that there is an increasing trend in the short-term components of working capital financing.

Chowdhary and Amin (2007) in his study emphasized on working capital management practices in pharmaceutical companies listed in Dhaka stock exchange for a period of 2000-2003. The study was based on a sample of 8 firms. The study found a positive relation between current assets and financial performance. Further, there is efficiency in managing cash, accounts receivable and payable. At last, the inventory has a positive impact on firm's performance which stands well in case of pharmaceutical industry. The study suggested that the firms should maintain a certain level of cash and inventory level effectively for better performance.

Vishnani and Shah (2007) made an effort to make an empirical study of Indian consumer industry for assessing the impact of working capital policies and practices on profitability during the period 1994-95 to 2004-2005. The sample is based on a 23 listed companies of the Indian consumer industry and the data is collected from CMIE – prowess. Statistical test such as simple regression analysis and simple correlation analysis were used to examine the impact of working capital policies between profitability ratio and some key working capital policy indicators ratios. The study found that majority of sample firms indicated a positive correlation between liquidity and profitability. Regression analysis indicated that majority of sample firms are positively associated between liquidity and profitability. The majority of sample firms depict a negative association between ROCE and IHP (Inventory holding period), DCP and NWC Cycle and positive association between Return on capital employed and creditor's payments period. Further working capital management policies and practice have a profound impact on a company's profit performance. The author suggested that managers should give due attention towards policy formulation as well as implementation of such working capital policies.

Juan and Martinez (2007) attempted to study the effects of working capital management on the profitability of SME. The sample consisted of 8872 small and medium sized enterprises. The time period of the study was confined to the period of 1996 – 2002. The author found that there is a negative relationship between SME's profitability and number of days account receivable and number of day's inventories. Therefore more restrictive credit policy gives customers less time to make their payments

thereby improving performance. Further holding inventory for less time by reducing the inventory holding period also improves the profitability of firms.

Appuhami (2008) conducted an empirical study to know the impact of firm's capital expenditure on working capital management across industries in Thailand. The study was based on a sample size of 416 companies listed on the stock exchange in Thailand for the period of 2000 to 2005. The study used net liquidity balance and working capital requirements as a proxy for working capital measurement. The study found that firm's capital expenditure has a significant impact on working capital management. Further, the firm's operating cash flow which was recognized as a controllable variable has a significant relationship with working capital management.

Nobanee and Alhajjar (2009) investigated the relationship between working capital management, corporate performance and operating cash flows of a sample of 5802 U.S non- financial firms listed on the new York stock exchange over the study period of 1990-2004. The author found that reducing receivable conversion period and cash conversion period will help the firm to achieve better performance and high operating cash flows whereas slowing down of payments will lead to low profitability and operating cash flows. Further lengthening the inventory conversion period will help the firm to increase profitability and operating cash flows. The author suggested that, the firm can improve their profitability and cash flow by adjusting the working capital management variables accordingly without affecting the credit reputation and harming the profitability and cash flows of the firm.

Karaduman, Akbas, Ozsozgun, and Durer (2010) attempted to provide empirical evidence on the effects of working capital management on the profitability of 140 selected companies listed on the Istanbul stock exchange for the period of 2005-2008. Independent variables are represented by accounts receivables, accounts payable, inventory and cash conversion cycle whereas dependent variable is represented by return on assets. The study found that a company can increase its return on assets by shortening number of days account receivable, account payable and number of days of inventory. Further reducing cash conversion cycle will have a positive impact on return on assets.

The study suggested that company should focus on working capital variables in order to improve the performance of the company.

Mohamad and Saad (2010) focused on the working capital management and its effect on the performance of Malaysian listed companies from the perspective of market valuation and profitability. The study used a sample size of 172 listed companies randomly selected for the period of 2003 to 2007. Working capital management variables such as cash conversion cycle, current ratio, current assets to total asset ratio, current liabilities to total assets and debt to asset ratio and performance value was represented by Tobin Q, and profitability was explained by return on asset ratio and return on invested capital. Statistical tool such as correlation and regression were used to show the significant association between working capital variables and firms' performance. The results indicated that Current assets to total assets ratio (CATAR) has a significant positive relationship with firm value, Return on assets (ROA) and Return on invested capital (ROIC) whereas Cash conversion cycle (CCC) and Current assets to total assets ratio (CLTAR) show a significant negative relationship with firm value, ROA, and ROIC. It is suggested that managing working capital efficiently will improve the firm's market value and profitability and therefore working capital should form company strategic and operational thinking to promote firm performance efficiently and effectively.

Mathuva (2010) attempted to study the influence of working capital management components on corporate profitability with a sample of 30 Kenyan listed firms selected from the Nairobi stock exchange (NSE) for the period of 1993 to 2008.The author found a negative relationship between the accounts collection period and profitability. The management of a firm can reduce the number of days account receivable to create value for their shareholders. There exists a highly significant positive relationship between the periods taken to convert inventories to sales. The management can increase their inventories level to reduce the cost of possible interruption in production and the cost of supplying the products against price fluctuations to increase profitability. Further, there exists a significant positive relationship between payment to its creditors and profitability. The manager can delay payment to creditors to gain profits. At last, the

study concluded that cash conversion cycle has to be reduced to a minimum, by making efficient and effective utilization of resource boost the profitability of firms.

Raheman, Afza, Qayyum, and Bodla (2010) highlighted the management of working capital and corporate performance of manufacturing sector in Pakistan for a period of 1998-2007. The study was based on a sample of 204 manufacturing firms which were listed on Karachi stock Exchange. It was found that cash conversion cycle, net trade cycle and inventory in days have a negative relationship with net operating profitability. Therefore, to create value to shareholders the firms must try to keep these to minimal. Further, there was a negative but insignificant relationship between account collection Period and net operating period. The average payment period with net operating period was positive, therefore higher the payment period higher the net operating profits. Moreover, the increase in financial leverage, sales growth and firm's size has a positive impact on the performance of a firm's profitability. The author concluded that firms are following conservative working capital management policy and suggested to concentrate and improve their collection and payment policy.

Charitou, Elfani, and Lois (2010) investigated the effect of working capital management on firm's financial performance in an emerging market. The study was based on a sample of 43 firms selected from the Cyprus Stock Exchange for the period of 1998-2007. Multivariate regression analysis was used to identify whether working capital management leads to improved profitability. The results indicated that the firm's financial health is inversely related to the components of the cash conversion cycle and leverage. High leverage firms are less profitable due to the fact that these firms have high default risk whereas growth leads to profitability. The study suggested that efficient utilization of the firm's resources leads to increase in the profitability and reduces volatility which leads to the reduction in default risk and thus improves the firm's value.

Chatterjee (2010) analyzed the impact of working capital on the profitability for a sample of 30 UK companies listed in London Stock Exchange for a period of 2006-2008. Pearson's correlation was used for this analysis. The study found a strong negative relationship between variables of working capital management and profitability of the

sample firms. It means when the cash conversion cycle increases, it leads to decrease in profitability of the firm. It was also found that there is a significant negative relationship between the liquidity and the profitability of the UK firms whereas a positive relationship exists between the size of the firm and profitability. Furthermore, there is also a significant negative relationship between debt used by the firm and its profitability. The results suggest that the managers can increase corporate profitability by speeding up collections, reducing the number of day's inventories and make payments to creditors as early as possible.

Dong and Su (2010) attempted to explain the relationship between working capital management and profitability using the fixed effects model for a sample of 130 companies listed in Vietnam Stock Market for the period 2006-2008. Statistical tools such as Pearson's correlations and multiple regression analysis were used to investigate the impact of working capital management on corporate profitability. The results indicated a significant negative relationship between profitability and the receivable conversion period, inventory conversion period and the cash conversion cycle. There is a significant positive relationship between payables deferral period and profitability. Furthermore, all three control variables – size of the company, financial leverage, and the ratio of financial assets to total assets were found significantly and positively associated with the profitability of the company. The study suggested that managers can improve shareholders value by reducing the cash conversion cycle to a reasonable range by reducing the number of day's accounts receivable and investments to improve profitability.

Danuletiu (2010) attempted to understand the relationship between the management of the operating cycle and profitability for a selected sample of 20 large companies from Alba County. The time period of the study was 2004-2008. Statistical techniques such as Pearson correlation analysis were used to know the relationship between the efficiency of working capital management and profitability. The study found that there is a weak negative linear correlation between working capital management indicators such as day's sales outstanding, day's inventory outstanding, day's payable outstanding and day's working capital and Profitability ratios represented by Return on

assets, return on investment and return on sales. The trend of applying an aggressive policy of operating cycle management has been increasing from the year 2005 to 2008. Most of the sample firms applied an aggressive policy of operating cycle management rather than defensive policy.

Singh and Asress (2010) attempted to assess the working capital adequacy and its impact on profitability. The study investigated the relationship between profitability and liquidity of firms by using a sample of 250 firms from Indian manufacturing industry for the period of 1999 to 2008. It was found that there is no significant difference in insolvency levels of companies within the manufacturing industry. The firms with adequate working capital in relation to their operational size perform better. It was also found that the shorter the cash conversion cycle, lesser the time required for converting sales into cash. Therefore, increasing cash levels for acquiring inventories helps in smoothening day to day operations of the firm. Finally, there exists a negative relationship between profitability and liquidity of the sample firms. It means that lowering the liquidity level will enhance better performance and vice-versa.

Erasmus (2010) studied the relationship between working capital management and firm's profitability for a sample of 319 firms containing both listed and delisted South African industrial firms. Net trade cycle was used as a measure of working capital management. The time period of the study was from 1989 to 2007. The results indicated that there exists a statistically significant relationship between firm's profitability and net trade cycle, current ratio and debt ratio. It means that decrease in net trade cycle could result in an improvement of firm's profitability. In the case of delisted firms, it would appear that the relatively short term, operating measure of net trade cycle plays a less important role than the current and debt ratios. The study suggested that managers need to focus on working capital management and ensure that the over investment in net working capital does not happen to increase profitability and ultimately creating value for shareholders.

Gill, Biger and Mathur (2010) emphasized on the relationships between the working capital management and the firm's profitability for a sample of 88 American

manufacturing companies listed on the new York stock exchange for the period of 3 years from 2005-2007. The author suggested that profitability can be improved by reducing the credit period granted to the customers. It was found that there exists no statistically significant relationship between average days of accounts payable and profitability and a positive relationship exists between cash conversion cycle and gross operating profit, and no significant relationship exists between firm size and its gross operating profit ratio.

Mittal, Kumar and Bhavet (2010) examined the trend in working capital management and its impact on firm's performance. It was based on a sample of 58 small manufacturing firm's covering five industry sub-sectors for the period of 2003-2008. Panel data analysis was used for the study. Return on total assets was used as a measure of profitability and the key variables used in the analysis are number of inventory days, number of accounts receivable days, number of accounts payable days and cash conversion cycle. The study found that return on total assets is significantly positively correlated with operating profit margin and capital turnover ratio but negatively correlated with the measures of working capital management except for cash conversion cycle. The firm's profitability increases with firm's size, gross working capital efficiency and with a lesser aggressiveness of asset management. Further the study found an increasing trend in the short-term components of working capital financing.

Sharma and Kumar (2011) aimed to examine the effect of working capital management and profitability of Indian firms. The sample of 263 non-financial firms listed on the Bombay Stock Exchange for the period of 2000 to 2008 was selected. The profitability was measured using return on assets and working capital was measured using number of day's accounts receivable, number of day's accounts payable and number of day's inventory. The study found a positive correlation between working capital management and profitability. Further, the inventory of number of days and numbers of day's accounts payable are negatively correlated with firm's profitability whereas the number of day's accounts receivable and cash conversion period exhibits a positive relationship with corporate profitability.

Seeger, Locker and Jergen (2011) aimed to reveal the working capital management performance of Swiss-based Chemical and Pharmaceutical companies. The sample consists of 18 companies listed at Swiss Stock Exchange located in Switzerland for the time period of 2000-01 to 2007-08. The ratios such as days sales outstanding, day's inventory outstanding, day's payable outstanding and day's working capital have been used in this study. It was found that receivable and payable day's outstanding have increased from 2001-2008, whereas day's inventory outstanding has decreased due to the better supply chain and outsourcing of certain activities. The working capital management performance over the study period has improved by 16%. Further 11 Out 18 firms exhibit a lower day's working capital ratio in 2008 than in 2001. The study suggested that consistent and ongoing monitoring ensures sustainable improvements and can be supported and enhanced by a benchmarking analysis and the adoption of best practices will improve performance.

Kequan (2011) attempted to analyze the performance of working capital management of listed companies in China. The study was based on a sample of 842 companies in 12 different sectors. Days of operating cycle and cash conversion cycle were used to evaluate working capital performance. The results indicated a significant difference in performance of working capital between firms in different industries and different geographical areas, rather than differences in operational history.

Niazi et al (2011) attempted to study the application of working capital policy and performance assessment of financial ratios and their relationship with organization performance based on a sample of 79 firms listed on the Karachi Stock Exchange in Pakistan. Primary data was collected through questionnaire method. The results indicated that the decision makers were aware and agreed to the fact that the practices of working capital policy and financial ratio are utmost important for the growth and performance of organizations. Further Regression analysis indicated that working capital and financial performance assessment ratios have a positive and significant impact on organization performance. The study suggests that both the companies and policymakers should formulate new strategies to promote and train the financial managers to make decisions in formulating working capital policy.

Pandey and Jaiswal (2011) attempted to study the working capital components and impact of working capital management on the profitability of Nalco. The author also attempted to explain the correlation between liquidity and profitability of Nalco. The study was based on secondary data collected from the annual report of Nalco for the period of 1995 to 2008. Ratio analysis and percentage method and coefficient of correlation were used to analyze the data. Statistical techniques such as multiple regression were used to check the significant impact on the profitability of Nalco.

Ching, Novazzi and Gerab (2011) investigated the difference between corporate profitability and working capital management in working capital intensive and fixed capital intensive group of companies. The study also identified variables that most effect profitability. The data for the measures of variables were collected from financial statement of sample companies from CVM Brazilian securities exchange commission over the period of 2005 – 2009. Total of 32 companies and 160 observations were used for the study. The sample comprised of 16 working capital intensive firms and 16 fixed capital intensive firms listed in Brazil. The analyses of vacancies were employed to identify the significant variable in the multiple regression that influence ROS, ROA and ROE in a similar group of companies. The study found that working capital management is improved by decreasing days of inventory. There is an improvement in return on sales and return on assets for companies that use working capital intensively and further CCE helps to improve ROS but not ROA. Regression analysis identified statistical evidence that debt ratio is negatively related to ROA for companies that use fixed capital intensively. The authors concluded that to manage working properly is equally important for companies that use working capital intensively as well as for those that use fixed capital intensively.

Chatterjee (2012) attempted to explain the impact of working capital on the profitability for a sample of 100 Indian companies listed on the Bombay Stock Exchange for a period of 2 years from 2009-2011. Working capital management was explained by variables such as receivable days, inventory turnover days, payable days, cash conversion cycle, current ratio and quick ratio on the net operating profitability of sample companies. Further controlled variables like fixed assets on total assets, the debt ratio and the size of

the firm (measured in terms of natural logarithm of sales) were also used. The study found a strong negative association between the components of the working capital management and the profitability ratios, and negative association persists between the liquidity and the profitability of the Indian firms.

Thuvarakan (2013) attempted to understand the relationship between the working capital management, debt and size of the firm and profitability for the period of 5 years. The study used a sample of 97 firms (60 UK manufacturing firms, 20 construction firms and 17 telecommunication) listed on the London stock exchange. The working capital was measured by variables such as receivable days, payable days, inventory days, cash conversion cycle, debt, and size of the firm, whereas profitability was measured by gross operating income. The study found that there is no significant relationship between the relationship between the working capital components and profitability in the manufacturing industry, telecommunication industry and construction industry.

Panigrahi and Sharma (2013) investigated the relationship and impact of working capital management and profitability by selecting five Indian cement companies for the period 2001-2010. Variables such as average receivable period, inventory conversion period, average payment period and the cash conversion cycle were used as a measure of working capital efficiency. It was found that there exists a negative significant relationship between accounts receivable period, accounts payable period and firm's profitability. Cash conversion cycle and profitability have shown a positive relationship.

Chanchal (2014) attempted to explain the effect of working capital management on the profitability of seven Indian cement companies. The period of the study was one year i.e., 2012. The study used gross profit ratio as a measure of profitability of company and variables such as account receivable turnover, creditor's turnover, inventory turnover and current ratio as a measure of working capital management. The study found that there is a significant impact of the working capital management on the profitability of companies.

Enqvist, Graham, and Nikkinen (2014) examined the role of business cycle in working capital and corporate profitability using a sample of 1136 firm-year observations

over an 18-year period (1990-2008). Return on Asset and gross operating income were used to measure profitability. The study found that the companies can achieve higher profitability levels by managing efficient inventory levels, lowering accounts receivable collection times and shortening the accounts payable cycle for enhancing the corporate profitability. Further, the impact of efficient inventory management, accounts receivables conversion period on corporate profitability increases in economic downturn period. The author suggested that investment in working capital is essential in day-to-day routines of firms for efficiency in working capital management and which in turn leads to profitability.

Agha (2014) empirically tested the impact of working capital management on profitability using secondary data from Glaxo Smith Kline pharmaceutical company registered in Karachi stock exchange for the period of 1996-2011. The study used return on assets ratio as a measure of profitability and account receivable turnover, creditor's turnover, inventory turnover and current ratio as a measure of working capital management. The study found that there is a significant impact of the working capital management on profitability. Hence, managers minimize the inventory turnover, account receivables ratio and decrease creditors turnover ratios to improve profitability. Further, there is no significant effect of increase or decrease in current ratio on the profitability of the sample company. It is suggested that efficient working capital management will increase the profitability of the Pharmaceutical companies.

Bhunia and Das, (2015) attempted to understand the underlying relationship between working capital management and profitability of pharmaceutical companies in India for the period of 2003 to 2013. The study was based on secondary data obtained from the centre for monitoring Indian economy database. The study found that there is no significant relationship between working capital management and profitability. In other words, there is a low degree of relationship exists between working capital management and profitability.

Jahfer (2015) studied the effects of working capital management on the profitability of manufacturing companies in Sri Lanka for the period 2008 to 2013. The

study used both pooled ordinary least squared and fixed effect model for analyzing the data. Working capital management variables such as accounts receivable, accounts payable, inventory period, cash conversion cycle and net trading cycle were used. Gross operating profit was used to measure the profitability. This study found that managers can create value by reducing accounts receivable and net trading cycle and maintaining reasonable inventory level. Further, there is a significant negative relationship between accounts payable and profitability.

2.8 Working Capital Practices

Gitman, Moses and White (1979) examined the corporate cash management practices with a sample of 300 companies selected from the Fortune 1000 companies. The study used survey method to collect data from selected respondents. The sample comprised of two groups, namely top 150 companies and bottom 150 companies. The study found that managers were depending on budget to manage cash. The sample firms preferred to decrease the collection period and did not prefer to delay payments to suppliers. The group of top 150 companies used more sophisticated financial models to manage components of working capital management when compared to the group of bottom 150 firms.

Gentry et al. (1979) investigated the perceptions of management of working capital objectives, and compared and contrasted working capital practices in four countries namely U.S, Belgium, France and India. The study was directed to identify the variables which influence cash flows of the sample firms. The sample consisted of Fortune 500 companies in U.S and large companies in other three countries. The majority of the sample indicated that the objective of working capital management is to support anticipated sales and minimize the level of working capital components to strengthen market dominance of firms and internal communication between the departments improve forecasting of cash flow.

Smith and Sell (1980) investigated the responsibilities, objectives and practices of working capital management. The selected sample for the study was limited to 400 companies. It comprised of 200 largest and 200 smallest companies drawn from the

Fortune 1000 companies list. The study found that the top management was given the authority to take working capital decisions. Most of the sample firms preferred to adopt situational working capital policy due to the flexibility in changing working capital policy with the change in consumer demands.

Belt and Smith (1991) compared working capital management practices in Australia and the United States. The study was based on primary data using 35 questions survey. A sample of 300 managers was selected over a period of 10 years. The sample was selected from the Fortune 1000 largest U.S. industrial firms and Australian Business Top 500 Companies. Chi-square test was used to see the impact on size, profitability and policy formality. The study found that there exists both commonalities and differences in the working capital management practices in both the countries. The U.S firms were found better in inventory, credit/ collection and marketable securities management than the Australian firms. The later firms were found more efficient in making payments and required less managerial oversight. Further, the Australian firms are more centralized in policy setting and daily management of working capital accounts than the U.S firms. The managers in both the countries faced similar problems and seemed to respond in a relatively comparable way.

Peel and Wilson (1996) examined the working capital and capital budgeting practices of 250 small manufacture and service sector firms employing 50 or fewer employees located in the north of England. A questionnaire was used to collect data in the year march, 1983. A total of 84 firms responded out of 250 sample firms. The results of the survey indicated a relatively high proportion of small firms among the sample claimed to use quantitative capital budgeting and working capital techniques and to review various aspects of their companies' working capital. Further firms which claimed to use the more sophisticated DLF capital budgeting techniques, or which had been active in terms of reducing stock levels or debtor's credit period on average tended to be more active in respect of working capital management practices. The author asserts that smaller firms should adopt formal working capital management routines in order to reduce the probability of business closure as well as to enhance business performance.

Ricci and Morrison (1996) analyzed the international working capital management practices of the Fortune 200 companies in the U.S.A. A survey method was used to understand the international practices of working capital. The purpose of the survey was to obtain information on some international aspects of working capital management in major U.S.A firms. The Study found that the Fortune 200 companies are fairly advanced and practical in their international working capital management activities, particularly in using those methods which impact sales increase.

Ooghe (1998) examined the financial management practices in China with a selected sample of 16 large companies located in Shanghai. The study found that the sample firms did not have comprehensive working capital process due to which there is no clear indication of working capital policy. Further, there is no stringent credit and collection procedures, delayed payments due to relaxed strategy towards suppliers and managers lacked knowledge of working capital.

Maxwell, Gitman and Smith (1998) attempted to identify changes in working capital management practices of U.S firms between 1979 and 1996. The present study was an extension of Gitman et al (1979). A sample of 78 U.S and 55 Non-U.S large companies were selected for the study. The survey method was used for data collection. The study found that there is a considerable change in the way companies managed cash in terms of technology usage (such as electronically wired transfer) to accelerate the process of collections. The sample U.S firms have utilized the electronic banking facilities to fasten the process of collection as compared to Non-U.S firms.

Khoury, Smith and Mackay (1999) conducted a survey to examine the working capital practices of small Canadian companies. The selected sample consisted of 57 respondents. It compared between the Canadian firms and the result of previous surveys results in Australia and the United States. The study found that most of the sample Canadian companies do not have formal working capital policies. Most of the sample respondents adopted a situational change in working capital policy in comparison with the previous surveys. The Canadian firms used old methods for managing inventory as compared to Australian and United States firms, which have better technology usage or

computerized methods. The differences can be attributed due to the small response rate and the cultural differences that existed in different countries.

McInnes (2000) attempted to understand the working capital practices of listed New Zealand companies. The study selected a sample of 125 limited liability companies listed on the New Zealand Stock Exchange with a response rate of 45.5%. The study enquired regarding the investment in working capital, working capital financing, cash management, accounts receivable management, inventory management, accounts payable management, cash conversion cycle (aggregative approach), factors that influence working capital, and performance measurement and analysis. The data was analyzed using computer package, SPSS. It was found that a sample of 94% firms did not integrate their components of working capital as proposed by the theory indicating no awareness, understanding, relevance and/or application of the cash conversion cycle is evident among New Zealand listed limited liability companies. Half of the respondents were concerned with managing the investment decision according to the theory. The evidence suggests that cash is reported on a daily basis, whereas accounts receivable, inventory and accounts payable are not.

Ricci and Vito (2000) investigated the international working capital management practices of the top 200 companies in the U K. The study used survey method to obtain information on some international aspects of working capital management in major British firms. The study indicated that decision regarding working capital is typically made at the corporate level. The majority of the firms are not using value dating, factoring and consignment. Most of the top U K companies continue to rely on simple, low-cost, low-risk methods of managing their foreign exchange activities.

Howorth and Westhead (2003) investigated the working capital management of small firms in U.K. for the period of 1970. The study selected a sample of 343 private companies across all industries located throughout U.K. It was found that firms which focus on cash management were larger but younger, with fewer cash sales, more seasonality, more external finance and possibly more cash flow problems; on the other hand, firms which focus on stock management routines were smaller, younger with less

external finance and longer production cycles. Further, the firm which focused on credit management routines had lower profitability and these firms were more interested in growth, more credit purchases and fewer customers paying on time.

Boisjoly (2009) investigated whether corporate financial management practices with respect to working capital management and reinvestment policies have altered the distribution of key financial ratios during the period of 1990 to 2000. The sample was limited to 50 largest non-banking corporations selected from fortune 500 to determine whether there is empirical evidence that management practices has changed. The study found that there were significant shifts in the mean of cash flows per share over the entire study period accompanied by some changes in accounts receivable turnover and inventory turnover for various sub-periods. The study concluded that the distribution have been altered significantly by management practices with the cash flow per share and investment ratio becoming less positive skewed and working capital per share negatively skewed. An aggressive management of working capital and significant increases in productivity by firms will lead to significant improvements in cash flow per share and reduced corporate reinvestment.

Noreen, Khan and Abbas (2009) analyzed the international working capital practices of multinational firms in Pakistan using a survey method. The questionnaire was sent to collect data from different industries mainly banking, telecommunication, service providers etc. to 150 companies and the response rate were 83%. The study focused on the international working capital practices such as are international sales, foreign exchange activities and international cash management. The results indicated that one-third of the sample firms in Pakistan have international operations (international sales). The decisions about working capital management are taken at corporate levels, which indicate that the decision is centralized. The sample firms use low cost and efficient international working capital methods. The electronic fund transfer and wire transfer are the most popular techniques used in international cash management because they are effective in terms of cost and speedy.

Wasantha and Wickremasinghe (2010) evaluated the working capital management practices of listed and non-listed manufacturing companies in Sri Lanka. The data were collected by administering a questionnaire and conducting interviews to the chief financial officers of the sample firms. A sample of thirty listed manufacturing companies and ten unlisted manufacturing companies were randomly selected. The study found that most of the sample firms have informal policy working capital policy. Lagging of credit payment and aging schedules are the major techniques in disbursement float and controlling trade debtors, respectively. Most of the sample companies used cash budget and current assets ratio as techniques to plan and control their working capital components.

Fatoki (2014) investigated the working management practices of immigrant entrepreneurs in South Africa. The data was administered a questionnaire using snowball sampling methods in the region of Johannesburg Central Business District in Gauteng province of South Africa. The sample respondents were 49. The study found that immigrant entrepreneurs on the average, keep accounting books and the usage of computer for operations is limited. Most of the respondents have bank accounts and do not prepare cash budgets. Most of the respondents buy and sell on credit. The sample respondents indicated that there is no written credit policy in place. It is suggested to improve the working capital management practices of immigrant entrepreneurs.

2.9 Some Specific Works on Power Sector

Few researchers such as Rao (1987), Schramm, (1993), Carstrairs and Ehrhardt (1995), Gupta and Sravat (1998), Narware (2004), Bhattacharyya (2007), Sreekumar, Reddy and Raghu, (2007), Sudhakar and Sreelatha (2010) and Srinivas (2011) have researched on power sector from different points of views. Some of the studies are:

Rao (1987) attempted to study the performance of Karnataka Electricity Board (KEB), over the period of 1970 to 1983. The objective of the study was to examine the revenue and capital accounts and financial position and problems encountered in Karnataka Electricity Board. This study used only secondary data for analysis. The author suggested that in order to improve the efficiency in the use of electricity, stringent

measures have to be adopted for its use, and defaulters should be dealt with severely. Further over indulgence of state government in state electricity boards is also responsible for the losses and underperformance of Karnataka Electricity Board.

Schramm (1993) attempted to study the issues and problems in the power sector of less developed countries. The author has pointed factors that will help in developing the overall power sector of least developed countries (LDC). The factors such as poor financial performance, inadequate capital, inappropriate investment policies, high transmission and distribution losses higher than world average, poor operating performance, overstaff and inappropriate skill mixes sizes in manpower, managerial and institutional issues such as government and politically motivated interference in the process had lead to overall inefficiency of power utilities in less developed countries. Further, the financial indicators in the majority of LDC are poorer than the average acceptable standards in the world. The study concluded that attracting huge capital from non-government sources will help in improving the operational and financial performance of utilities. The study suggested that the management of utilities should be on the basis of technical competence rather than political expedience.

Carstairs and Ehrhardt (1995*)* emphasized to know the factors that will affect the optimal capital structure for state electricity boards in India. In India, private power initiative of 1991 has offered one solution to the financing problems – the private financing of generation against long-term power purchase agreement. The state electricity boards, which are power purchasing agents, have encountered financial weakness in most states. The ability of state electricity board to sign credible long-term power purchase contract is weak. The state electricity board should try to become financially stronger through both cost reduction and increased revenue from higher tariff and better collection. The financial performance position of SEB was poor. Most SEBs was relatively inefficient producers. The cost per unit is high. Financial information for poorly performing state electricity boards is often several years old. The estimated average rate of return for all state power utilities in 1993-94 was a worse performance than in 1992-93. Further, the SEBs are unable to raise substantial private sector finance without a government guarantee. At last, the author concluded that SEB's profitability is too low

and therefore cannot raise equity finance. The study has suggested reforms to overcome these problems such as industry restructuring to unleash cost savings, increase in revenue, and legal reforms such as corporatization to allow SEB's to dispose assets and raise equity.

Gupta and Sravat (1998), in a qualitative research study, analyzed issues related to the development and project financing of independent private power projects in India. The author examined the critical issues related to government policy, power purchases, risk factors, financing, fuel supply, and transportation, and key success factors. A case study of Dabhol power projects was studied, which is the first Independent power project being developed by the foreign investor which is a good example of political risk and its management in the developing country like India. The author concluded that the factors restraining the private power projects to develop in India are high political risk, unstable economic environment, high bureaucratic system, poor credibility of power purchasers, fuel and transporters which are run by state-owned monopolies, and the immature capital markets especially the long-term debt market. The study suggested that the credibility of the state electricity boards should be improved, capital markets should be developed and regulatory process should be streamlined, fair commercial contracts should be implemented between fuel suppliers and transporters.

According to Distribution Committee Report, Ministry of Power (2002)

"The investors would be taking over entities, which are highly inefficient in their working capital management. The earlier SEBs survived on Table of Contents the fact that in case a payment from the consumers does not come through they would delay/not pay their payments for power purchase. However, once these distribution companies are privatized the same system cannot continue. In this scenario, the payments from the consumers are not forthcoming, loans (with lower coupon rate) to fund the gap between the revenue collected and the working capital requirement would greatly help the distribution companies. In this regard, the central government could consider funding by the government agencies, which may be linked to the performance by the states of reform milestones. Such funding may be provided without the usual restrictions on borrowing limits of the states. A plan should be developed by the private sector to identify this gap

based on realistic cash flow, recovery rate, progress in reducing energy losses, improving billing and collection etc."

Narware (2004) in his paper presented a modern approach to power sector reforms, with the objective of electricity to all by 2010. The author pointed that efficiency of power generation has improved but the problem of power shortage, blackout is still continuing. It was found that the transmission and distribution loss has increased during 1997-2000. The non-payment of subsidy to State Electric Board by union/state government and electricity theft is a major concern in power sector. The gap between average cost and power supply charge has been increasing. The author suggested that to increase earning rate of electricity, generation cost must be reduced by upgrading technologies and by restructuring Sate Electric Boards. The reforms and accelerated programs should be implemented for accelerating growth and Development. The author concluded that the success of government efforts would depend upon how innovative and modern methods are adopted in power sector.

Sreekumar, Reddy and Raghu (2007) critically examined the strength and challenges of Andhra Pradesh power sector. The author has specifically pointed out that the power supply issues and distribution issues of power sector in Andhra Pradesh. The supply issues such as supply of gas and maintenance issues at some thermal stations still continue to the increase in inefficiency. Utilities have failed to provide maintenance service for distribution transformer failures. The distribution companies' do not have requisite expertise to handle the power purchase function. The power purchase agreement has been a disaster causing high power costs. Though the overall financial and technical efficiency of power utilities increased but the quality of supply and services to rural areas has been poor and deteriorating. The study suggested that power utilities should enable themselves to face the challenge of continued demand growth and rural electrification. Further, he opined that public participation in the policy and regulatory processes can improve the situation.

Bhattacharyya (2007) aimed to examine the scope of power sector reforms in India. The author further suggested factors that affect the reform process and the

performance of the sector. The reforms can be considered as sustainable if they are politically acceptable, financially viable, economically efficient, socially desirable, environmentally kind and implementable as a project. The author described factors which can lead to sustainable reforms through politically (desirable feasible credible), Financially Viable i.e. (reduced state support, revenue adequacy), Economic efficient (efficiency system adequacy, signal), Social desirable (accessible, affordable, minimize social cost), environmentally kindly (fuel and technology choice, concept on behavior location and rise), and Implementable (simple process ease of transition simple legal changes). At last the author concluded that despite having a good legal framework for reforms, the rate of implementation of reforms is low due to poor overall acceptance. Further, the reformed utilities are lacking creditworthiness and technical performance has not improved as expected. The study suggested that the imported ideas are not a sure recipe for success. India should frame reforms according to the political and economic support for the reforms in power sector.

Meenakumari and Kamaraj (2008) attempted to measure the relative efficiency using data envelopment analysis to find the overall efficiency, Technical Efficiency and Scale Efficiency of state-owned electric utilities in India. The study used a sample of 29 SOEUs in India. The study found that there exists inefficiency in 22 SOEUs. Furthermore, most of the inefficient DMUs suffered from scale inefficiency rather than from technical inefficiency.

Khatik and Jain (2009) analyzed the cash management position of Madhya Pradesh State Electric Board for the period of 1995-96 to 2004-05. This study used ratios such as cash turnover ratio, daily cash payment ratio, basic defensive internal ratio, cash position ratio, absolute liquid or super quick ratio and cash to debt service ratio. It was found that the position of financial ratio analysis in MPSEB is not satisfactory. The firm did not maintain adequate cash in hand and bank, therefore sufficient funds were not available for making daily payments. The study suggested that cash levels have to be increased to improve liquidity to make short-term obligation of payments.

KPMG (2010) reported the measured gaps between the planned versus the achievement of power and attempted to analyze the problems therein. It indicated that in past, India could not achieve even half the targets that it has planned during last these five year plans. The study identified various reasons for gap such as inadequate preparedness of projects, shortage of equipment (Boilers, Turbines and Generators), delay in land acquisition and environment clearance, delay in financial payments, manpower shortage, schedule dependency on transmission lines. They suggested that a sound project management system will enhance a better and efficient track of all the aspect of project execution, ensuring timely addressed or issues. According to the author, the challenges of power sector can be addressed through various well-defined frameworks of processes such as Project Strategy, organization and administration, cost and financial management, procurement management, project controls, quality to risk management and schedule management.

Saxena and Thakur (2010) indicated that the electricity distribution utilities in India are performing sub-optimally and need to be reorganized.

Sudhakar and Sreelatha (2010) attempted to analyze the cost structure of power distribution companies in post-reform period and assessed the impact of various cost and revenue parameters on the various cost incurred by power distribution companies. It also examined the relationship between the operating expenses and net sales for a sample of four power distribution companies (PDC's) for a period of eight years i.e. from 2000 to 2008. Statistical techniques such as simple regression analysis were used to assess the firms with a very high operational efficiency. Variables such as average revenue, average cost, total revenue and total cost were used. It was found that all the four companies were having negligible profits but at the end of eight years, the net profit ratio had been increasing. SPDCL was found to be the most stable company and the most operational efficiency among the sample. In terms of operating expenses and operating income EPDCL stood first.

Srinivas (2011) studied the earnings and working capital management of power sector in India. He selected a sample firm of 17 prominent companies in India which

include both small and large firms. The study found that 94% of the companies recorded a positive correlation between sales, output and working capital. Most of the companies followed the inadequate category in current ratio. The power sector depended on upon the short-term working capital financing from commercial banks. Statistical measurement tools such as Arithmetic mean, Median, Mode, Standard Deviation, Range, etc. covering Central Tendency, Measures of Dispersion and Correlation were used.

Balasubramanian (2012) reported that there is a clear lack of credible information. Lack of proper consumer database is the biggest obstacle for the discoms with respect to proper billing and collection of revenues in power distribution utilities. Therefore there is a need for implementation of comprehensive IT interface system with this issue. Further lack of proper information poses challenges in estimating losses.

Pargal and Ghosh (2014) have stated that "stakeholders outside of government, specifically the regulator and commercial financial institutions, critically affect the operating environment and thus power utility performance. The incentives of these players and the government (both as a policy maker and as owner) need to be aligned to support utility performance. At the same time many factors that constrain performance are under the control of the utilities themselves—under pricing, physical losses, and inefficiencies in bill collection—underlining the importance of limiting the government's role, strengthening regulatory governance, and bolstering competition so that utilities are both pushed to be efficient and permitted to run on commercial lines."

Wilkes Tommy (2014) have stated that power sector can be revitalized by improving the performance of distribution utilities, and ensuring that players in the sector are subjected to financial discipline. The largely state-owned utilities should raise tariffs in line with their costs, receive more compensation for the subsidies they provide to rural users and improve their accountability to regulators and consumers.

CHAPTER-III

RESEARCH METHODOLOGY

3.1 Introduction

Working capital is the lifeline of business. Financial experts believe that the survival and prosperity of business in a competitive environment is not possible without the optimal management of working capital. Capital assets play an important role in the long run as well as the short run operation of a business and working capital has a significant part in the same. If the business runs smoothly in the short run, there is a greater probability of the business operating better than the others in the long-run. Hence, managing current assets and current liabilities is important for business performance in the short run as it affects the long run performance. Current assets include inventories, debtors, short-term marketable securities, and cash, whereas current liabilities include short-term debt, trade creditors, accruals, and provisions.

It is very important for the financial manager to keenly observe, scrutinize, monitor and take decisions due to short life span and speedy transformation of current assets from one form into another to enable smooth functioning of the business. Since decisions related to working capital management are repetitive and frequent in nature; they have to be evaluated continuously. "It is expected that the way in which working capital is managed will have a significant impact on the profitability of the firm" (Deloof, 2003) on the other hand "it is the firm with an optimal level of working capital which maximizes its value" (Gill, Biger and Mathur, 2010). "Efficient management of working capital is an important component of a general strategy aiming at increasing market value" (Afza and Nazi, 2007). Hence, it is very important to use these precious resources effectively and efficiently in the course of business by trading off between liquidity and profitability.

"The optimal working capital management is achieved by a firm that manages the tradeoff between profitability and liquidity" (Bhunia, Khan and Mukhti, 2011). The main aim of any business is therefore to maintain an optimal balance between liquidity and profitability. This can only happen when managers optimize the working capital by

ensuring lower investment in each component of working capital such as lower inventory levels, least average collection period and higher payment period to creditors.

In power distribution utilities, cash and debtors play a vital role. Cash management of firms is an important aspect of working capital. To enhance the efficiency of cash management, collections and disbursements of cash must be properly monitored. Surplus cash should be invested in marketable securities such as certificates of deposit, commercial paper, treasury bills that can be converted easily into cash within a short period of notice. Another important component is receivables which must be promptly collected and measures should be taken to avoid doubtful and bad debt losses.

3.2 Importance of Power Sector

One of the major requirements for sustainable and inclusive economic growth is an extensive and efficient infrastructure network. It is critical for the effective functioning of the economy and industry. "The key to the global competitiveness of Indian economy lies in building a high-class infrastructure" (Economic survey, 2010-11). Economic infrastructure like transportation, communication and power, facilitates the growth of economic activities to contribute national or state GDP through Revenue mobilization (The Economy of Andhra Pradesh, 2007-08). Therefore, power sector is a primary requirement to drive the overall development of the Indian economy. Unavailability of power will lead to low production, hence low trades and business. The requirement of power does not restrain to only business entities or domestic consumers, but also requires for agricultural and other purposes.

3.3 Implication of Working Capital

There is hardly any business, which does not require working capital; either it is a small or large firm or capital intensive or labor intensive industry or it is a manufacturing sector or service sector. Working capital helps the firm to run the business well and maintain sound position. Consequently, any business is bound to collapse without an adequate supply of raw materials to process, inadequate cash to meet the office expenses, failure to grant credit to its customers.

Thus, working capital acts as the lifeblood of a business. In fact, any organization, whether profit-oriented or service motive firm will not function wholly unless proper management of day-to-day activities is maintained with adequate working capital.

3.4 Research Gap

A significant amount of work has been done in the area of working capital management. However, as compared to long-term funds, the research done on working capital is minimal. Moreover, the researchers have mostly focused on the aspects of liquidity, cash conversion cycle variables and profitability of firms. Thus, to explore new dimensions of possibilities to increase the performance of firms in short run and long run, further research has emphasized on the efficiency of working capital management at different points of time. It is found that there is the difference in various components of working capital in different industries (Filbeck, 2005 and Padachi, 2006) and across different geographical areas (Kequan, 2011). Efficient and effective management of working capital practices is required for the success of every firm. Moreover, service sector plays a vital role in the development of an economy but was totally ignored while making research studies (Bandyopadhyay, 2012).

Despite considerable literature review, the study has not come across many research studies related to working capital management in public sector enterprises including power sector. Therefore, there is a need to research on working capital management practices and short-term position of state-owned enterprises and private owned power distribution utilities. The reason behind lack of sufficient research in the area of infrastructure, especially power sector, may be due to the fact that they are capital intensive industries, and working capital as a proportion of total funds is very low. However, though the proportion of working capital to long-term capital is low, the volume of funds is comparatively high. Studies have ignored working capital management in the infrastructure sector, such as power where several problems such as inefficient collection of receivables are found and creditworthiness of the institution is questioned.

3.5 Significance of the Study

The present study aims to explain the importance of working capital management in power distribution utilities in India, which is a capital-intensive industry. Infrastructure is required for overall growth of a country, especially in power sector which generates and distributes electricity to other sectors for developing the economy. Electricity is a prime mover of economic growth and the expansion of the Indian economy would depend heavily on the availability of quality infrastructure, including electricity (Singh, 2006). In the case of Andhra Pradesh, about 56% of the total investments made in the infrastructure are invested in power generation and distribution. Therefore, it is important to know the financial performance of the power sector in the short run too. That is to know how well this sector is operating its business to build a sound financial base in the short run without affecting the liquidity and solvency of firms.

The specific reason to choose distribution companies is that they are the only revenue earners in power sector. Therefore, their performance has a direct impact on the financials of power generation and transmission utilities. Indeed, there is also a need to know whether the power distribution utilities are performing better in state-owned utilities or privately owned utilities. Therefore, there is a need to study the working capital management of selected power distribution utilities in India.

This study will contribute to the body of knowledge by identifying how power distributions manage their working capital. The research will provide a general outline to researchers, policy makers, professionals and review current working capital practices and provide guidelines for management in the rapidly changing business environment. This study will suggest measures to enhance and improve the performance of power distribution utilities in India.

3.6 Objectives of the Study

The broad objective of the study is to evaluate the working capital management in select power distribution utilities in India. The following are the specific objectives of the study:

1. To study the working capital management of select power distribution utilities.

2. To study the impact of liquidity, managerial efficiency and solvency on the profitability of select power distribution utilities.
3. To study the management of working capital finance in select power distribution utilities.
4. To study the cash management practices in select power distribution utilities.
5. To study the management of debtors in select power distribution utilities.
6. To study whether a difference exists in the management of working capital between the private and state-owned power distribution utilities.

3.7 Research Hypotheses

The first, third, fourth and fifth objectives are not amenable to hypothesis testing but the other objectives two and six, require hypothesis testing. The hypotheses of the study are:

H_1: There is a significant impact of working capital management on the profitability of select power distribution utilities.

1. There is a significant impact of quick ratio on return on capital employed
2. There is a significant impact of absolute liquid ratio on return on capital employed
3. There is a significant impact of debtor turnover ratio on return on capital employed
4. There is a significant impact of creditor turnover ratio on return on capital employed
5. There is a significant impact of collection efficiency on return on capital employed
6. There is a significant impact of interest coverage ratio on return on capital employed

H_2: There is a significant difference in liquidity, managerial efficiency, solvency and profitability across categories of utilities

1. There is a significant difference between the private and state-owned power distribution utilities in the management of net working capital.

2. There is a significant difference between the private and state-owned power distribution utilities in the management of current ratio.
3. There is a significant difference between the private and state-owned power distribution utilities in the management of quick ratio.
4. There is a significant difference between the private and state-owned power distribution utilities in the management of absolute liquid ratio.
5. There is a significant difference between the private and state-owned power distribution utilities in the working capital turnover ratio.
6. There is a significant difference between the private and state-owned power distribution utilities in the management of average collection period.
7. There is a significant difference between the private and state-owned power distribution utilities in the management of debtor's turnover ratio.
8. There is a significant difference between the private and state-owned power distribution utilities in the management of average payable period.
9. There is a significant difference between the private and state-owned power distribution utilities in the management of creditor's turnover ratio.
10. There is a significant difference between the private and state-owned power distribution utilities in the management of collection efficiency.
11. There is a significant difference between the private and state-owned power distribution utilities in the management of debt equity ratio.
12. There is a significant difference between the private and state-owned power distribution utilities in the management of interest coverage ratio.
13. There is a significant difference between the private and state-owned power distribution utilities in the management of return on capital employed.

3.8 Research Methodology

The nature of the study is descriptive research. It can be either quantitative or qualitative approach. The study is based on both quantitative and qualitative approach. The primary data is based on questionnaires, therefore, qualitative in nature and the secondary data is analytical, therefore, quantitative in nature. The descriptive research helps to describe and explain the condition of present by using subjects and questionnaire

to fully describe a phenomenon. In most of the quantitative research studies are intended to determine inference or underlying relationships. The study used questionnaires and discussion method to obtain data on working capital policy, financing, cash management, receivables management from general managers of power distribution utilities.

3.9 Sampling Method

The study uses the Judgmental sampling method.

3.10 Size of Sample

There are eleven states which were unbundled state electricity boards into generation, transmission and distribution utilities before 2005. Other states have either started the process of unbundling or have not accepted the idea of unbundling state electricity boards. Thus, the study selected seven states out the total eleven states which unbundled before 2005. The sample has been taken depending upon accessibility to data officially.

Table No.3.1: Unbundled State Electricity Board before 2005

States	Unbundled SEB Before April 2005	No. of Utilities	Sample
Odisha	1996	4	4
Andhra Pradesh	1999	2	2
Telangana	1999	2	2
Karnataka	1999	5	5
Uttar Pradesh	2000	4	-
Assam	2002	3	-
Delhi	2002	3	-
Madhya Pradesh	2002	3	3
Haryana	2002	2	-
Rajasthan	2003	3	3
Gujarat	2005	4	4
Total		**35**	**23**

Source: Compiled by Researcher

A sample of 23 power distribution utilities operating in India were selected for evaluating the working capital practices and measuring the impact of working capital variables on profitability. The sample selected across seven states, namely Gujarat, Rajasthan, Madhya Pradesh, Andhra Pradesh, Telangana, Karnataka and Odisha.

Table No.3.1: List of sample Utilities

S. No	Sample Utilities
1.	Central Electricity Supply Utilities.
2.	North Eastern Electricity Supply Company of Odisha Limited
3.	Southern Electricity Supply Company of Odisha Limited
4.	Western Electricity Supply Company of Odisha Limited
5.	Andhra Pradesh Central Power Distribution Company Limited
6.	Andhra Pradesh North Power Distribution Company Limited
7.	Andhra Pradesh Southern Power Distribution Company Limited
8.	Andhra Pradesh Eastern Power Distribution Company Limited
9.	Bangalore Electricity Supply Company Limited
10.	Chamundeshwari Electricity Supply Corporation Limited
11.	Mangalore Electricity Supply Company Limited
12.	Hubli Electricity Supply Company Limited
13.	Gulbarga Electricity Supply Company Limited
14.	Dakshin Gujarat Vij Company Limited
15.	Uttar Gujarat Vij Company Limited
16.	Madhya Gujarat Vij Company Limited
17.	Paschim Gujarat Vij Company Limited
18.	Madhya Pradesh Madhya Kshetra Vidyut Vitaran Company Limited
19.	Madhya Pradesh Paschim Kshetra Vidyut Vitaran Company Limited
20.	Madhya Pradesh Poorv Kshetra Vidyut Vitaran Company Limited
21.	Ajmer Vidyut Vitran Nigam Limited
22.	Jaipur Vidyut Vitran Nigam Limited
23.	Jodhpur Vidyut Vitran Nigam Limited

Therefore, the sample includes, all the states in which state electricity boards were unbundled into generation, transmission and distribution companies before April 2005, except for Delhi, Assam, Uttar Pradesh and Haryana have been selected.

All the sample utilities represented by their General Manager (Finance & Accounting) and General Manager (Revenue) have been taken. Thus the total respondents came to 46 (23 distribution utilities). However, two were found unsuitable, thus this brings the sample to 44. It is pointed out that mere size alone does not ensure representativeness. A smaller sample, but a well-selected sample, may be superior to a larger but badly selected sample The Table No. 3.1 shows the list of sample utilities taken for the study.

3.11 Source of Data

The source of data collection is separately mentioned for both primary and secondary data.

3.11.1Primary Data

The data was collected from respondents in person. The primary data is collected from General Manager (Accounts & Finance) and General Manager (Revenue) of power distribution utilities using a questionnaire. The questionnaire is attached in the Appendix A & B.

3.11.2 Secondary data

- Annual financial data and reports of concern power utilities.
- PFC Reports
- Journals
- Economic survey: Government of India
- Website of power sector utilities in India.

3.12 Instrument

A survey was used for the study. It involves an intensive study to cover a few samples and tends to dig deeper. A researcher uses either observation, or interview or questionnaire. In this study, a questionnaire was used to collect data through personal interview. The questionnaire covers questions regarding working capital policy, financing of working capital, cash management and receivables management of sample firms.

3.13 Period of the Study

The study covers a period of 10 years that is from 2004-2005 to 2013-2014. The reason for confining the study for this particular period is because reforms in power sector, such as unbundling was completed successfully and Electricity Act 2003 was enacted.

3.14 Tools of Analysis

Both quantitative and qualitative analysis was made. The study explains the working capital and financing, receivables management, cash management and practices and the impact of working capital management variables on the profitability of power distribution companies in India. The statistical techniques used for the study has been explained according to the objectives of the research.

3.14.1 Tools for Primary Data

The study consists of a small sample size. Hence the study used percentages to analyze and interpret data.

3.14.2 Tools for Secondary Data

The following tools have been used for secondary analysis.

3.14.2.a Descriptive:

For the analysis of secondary data, descriptive statistics such as average, median, standard deviation, coefficient of variation and the maximum and minimum values were used in this study.

3.14.2.b Mann-Whitney U Test

Mann-Whitney U Test is a non-parametric test. It is analogous to the t-test. It is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed. It is used to test the null hypothesis that two samples come from the same population (i.e. have the same median) or, alternatively, whether observations in one sample tend to be larger than observations in the other. In this study, it is used to know whether a difference exists between the private and state-owned power distribution utilities in the management of working capital management.

3.14.2.c Regression

A shortcoming of Pearson correlations is that they do not allow identifying causes from consequences (Deloof, 2003). Therefore, regression analysis was used to investigate the impact of independent variables on profitability variables.

Statistical tools regression analysis using fixed effect model and random effect model were used. Cross section weights were given by default; all observations were given equal weight in estimation. This study used Generalized Least Squares (GLS) regression. This method is preferred over the Ordinary Least Squares (OLS) system because under certain assumptions GLS will turn out to be asymptotically more efficient than OLS system (Wooldridge, 2002).

3.15 Software Used

The study used software such as SPSS and EVIEWS for analyzing the data. SPSS was used to understand whether there is any difference in the management of private owned and state owned power distribution utilities and Eviews 7 software was used to

run regression for measuring the impact of working capital variables on profitability. Tests such as panel unit root tests, generalized least squares (GLS) are used for the study.

3.16 Scope of the Study

The scope of the study is restricted to select seven states in India. The sample respondents are selected from twenty-three power distribution utilities in Andhra Pradesh, Telangana, Gujarat, Karnataka, Rajasthan, Madhya Pradesh and Odisha. The study attempts to understand the working capital management, working capital financing, cash management, receivable management and impact of working capital management on profitability.

3.17 Limitations of the study

The study is limited to select power distribution utilities which were unbundled before 2005 excluding Assam, Haryana, Delhi and Uttar Pradesh. The unavailability of a proper database of power distribution utilities was a major challenge. It is confined to understand the impact of short-term financial variables on the profitability of utilities and working capital practices. Besides, the various statistical tools which are used have their own limitations.

3.18 Thesis Plan

Title: Working Capital Management: A Study of Selected Power Distribution Utility in India-The study has been divided into following nine chapters as:

Chapter I: Overview of Power Sector in India

This chapter highlights an overview of power sector in the selected sample utilities. It begins with the overview, regulations, installed generating capacity, sector-wise growth, sources of power generation, investment in power sector, status of unbundling state electricity boards, post reforms initiatives for private participation, gap between demand and supply of electricity and problems in power distribution utilities in India.

Chapter II: Review of Literature

It defines the existing literature on determinants of working capital, financing of working capital, cash management, receivables management, relationship and impact of working capital management on the profitability of a firm.

Chapter III: Research Methodology

This chapter focuses on the introduction of working capital, an overview of power sector in India, research gap, significance of the study, objectives of the study, research methodology and type of research, sampling method, sampling size, instrument used for data collection, period of the study, source of data, and tools used for analysis.

Chapter IV: Conceptual Framework of Working Capital Management

This chapter deals with concept of working capital, gross working capital, classification of working capital, operating cycle of non-manufacturing firm, duration of operating cycle, cash conversion cycle, structure of working capital, components of working capital, accounts receivable, customers of power distribution companies, debtors management in power distribution utilities, monitoring default consumers, cash and role of cash management. Further, its explains ratios such as current ratio, liquid ratio, absolute cash ratio, average collection period, debtors turnover ratio, working capital turnover ratio, average payable period, creditors turnover ratio, debt-equity ratio, interest coverage ratio, and the return on capital employed. It also focuses on the working capital practices, working capital policy, factors affecting working capital management, working capital financing, cash management and receivables management.

Chapter V: Descriptive Analysis of Liquidity, Management Efficiency and Profitability Ratios: A Study of Select Power Distribution Utilities in India

This chapter deals with the descriptive analysis of liquidity, management efficiency and profitability ratios of sample utilities in India. It uses ratios such as net current assets, current ratio, quick ratio, absolute liquidity ratio, working capital turnover

ratio, average collection period, debtors turnover ratio, average payable period, creditors turnover ratio, collection efficiency, debt equity ratio, interest coverage ratio, and return on capital employed. The study analyzed the data by descriptive analysis tools such as minimum, maximum, averages, standard deviation and coefficient of variation. Further, Mann-Whitney U Test was used to understand whether there is difference in the working capital efficiency of select power distribution utilities.

Chapter VI: Impact of Working Capital Management on Profitability: A Empirical Study of Select Power Distribution Utilities in India.

This chapter discusses the working capital variables and profitability. Further dependent and independent variables are explained. Regression analysis will highlight the impact of the independent variable on the dependent variable. Further, an appropriate statistical tool will be used to evaluate the impact of working capital on the profitability of selected power distribution utilities in India.

Chapter VII: Working Capital, Financing and Cash Management of Select Power Distribution Utilities in India.

This chapter analyses working capital practices of selected sample firms. It focuses on working capital policy, financing of working capital and cash management practices of selected power distribution utilities.

Chapter VIII: Debtors Management Practices of Select Power Distribution Utilities in India.

This chapter deals with debtors management practices of selected power distribution utilities. It focuses on the criteria used for granting credit, bad debt, bad debts classification, aging schedule, critical success factor in reducing non-payments, the method used for collections, problems in the management of debtors and the ways to control defaulters.

Chapter IX: Findings and Conclusions

This chapter is present the findings and conclusion of the study.

CHAPTER – IV

CONCEPTUAL FRAMEWORK OF WORKING CAPITAL MANAGEMENT

4.1 Introduction

Financial Management is concerned with the procurement and utilization of funds in an effective and efficient manner to achieve financial goal of the business. Therefore one of the functions of financial management is concerned with financing and management of fixed assets and working capital. The capital or fund that is required at the start-up of a business is called initial investment and the capital that is required during the course of a business is variable or working capital. The working capital has played a significant role in sustaining the health of firms. It is an extremely important part of financial management because it directly deals with firm's day to day operations. Therefore, an appropriate level of working capital should be held throughout the life of a firm, to maintain sufficient liquidity and maximize profits.

As Adam Smith (1976) explained, the goods of the merchant yield him no revenue or profit, till he sells them for money, and the money yields him as little till it is again exchanged for goods. His capital is continuously going from him in one shape, and returning to him in another, and it is only by means of such circulation, or successive exchanges, that it yields him any profit. Such capital may be called circulating capital."

Working capital refers to short-term funds, which are required to run operational facilities of the firm. It is the funds that are required to meet the day-to-day operations of a firm. The level of funds required by a firm largely depends on the nature of the business. If it is a manufacturing concern, the working capital contributes around 90% of the total capital required for a firm. In case of services, it requires a very low volume of working capital as it runs on cash basis. Therefore it can be said that working capital is required for each every business. The requirement of working capital largely depends upon the magnitude and nature of business.

Effective and efficient management of working capital can ensure the survival of a business enterprise and grasp for breath in their efforts to maintain production and

remain solvent. The shortage of working capital would experience in the reduction of earning due to productive capital remains unutilized whereas excess working capital leads to extra costs for due to the desire for productive capacity.

Working capital, therefore, also provides insight on how efficiently a company's management is able to oversee the company's operations. The role of finance manager of a company is to ensure a trade off between liquidity and profitability which are equally important to balance and maximize the wealth of an enterprise.

If a firm has greater liquidity it will lead to lower profits and low liquidity leads to higher profits but at the stake of solvency, which is not recommendable for a good health of a firm. In the short run, liquidity can hold a stake, to boost abnormal profits, but in the long – run it can be fatal. Even firms which were earning high profits by ignoring liquidity have gone into bankruptcy. Therefore working capital has played a major role in designing the fate of businesses.

4.2 Concepts of Working Capital

On a conceptual basis, working capital has been understood in two different concepts – gross working capital and net working capital.

4.2.1 Gross Working Capital

It is also called as gross current assets. The total of current assets is called as gross working capital. It is a quantitative concept in nature. It is useful in providing the current requirement of working capital at the right time to enable the firm in realizing the maximum return on investment whereas Srivastava, (2003) believed that "Gross working capital focuses on the problems of managing individual current assets in day-to-day operations." It is in the nature of a qualitative definition that highlights attention on the level of current assets for given activity.

4.2.2 Net Working Capital

It is the difference between the total of current assets and total of current liabilities. The difference is called as net working capital. It is the excess or deficit of

current assets over current liabilities. In the case of excess, it is called as margin of safety. It is financed by the long - term source of finance.

4.3 Characteristics of Working Capital

1. Short life span

   The life of current assets such as cash, inventories, debtors, marketable securities is very short i.e., less than one year. Cash balances are held not more than one week, debtors are held for the duration of one month to six months and inventories are held not more than six months. The shorter the time duration of the operating cycle, shorter the life span of current assets and vice-versa.

2. Swift transformation

   One of the main characteristics of working capital is swift transformation of form to another form in the course of operating cycle. The case changes its firm by procuring raw material, the raw material is transformed into work in progress and then finished goods, which is sold in the market at credit, which generates a place for receivable and after the receivables are collected back it transform into original forms in the form of cash.

3. Level of working capital

   The level of working capital fluctuates from one level to another. The requirement of working capital changes due to the seasonal requirements, increase in production, market conditions, firms internal policy etc. Even the level of working capital changes regularly.

4. Repetitive and frequent in nature

   The working capital is required throughout the life of a utility/firm. Once the operating cycle starts, working capital is required in the form of cash to purchase raw material and ends with the collection of receivables from consumers at the end of every month. So every time a/an operation / process ends, another cycle starts, therefore working capital is repetitive and frequent in nature.

5. Inter-dependency among assets

   There is a close interdependency among different components of Current assets. Inefficient management of one component of working capital can lead to

the uneconomical use of another asset and can have an inverse effect on profit. Therefore financial managers should take utmost care while managing current assets.

6. Highly liquid

   Working capital components are highly liquid in nature, which can be transformed into cash whenever required, within a short period of time.

4.4 Classification of Working Capital

Working capital can be classified on the basis of "time and concepts". On the basis of concept, working capital is divided into gross working capital and net working capital. Gross working capital can be explained as the total of all current assets. Net working capital is the difference between the total of current assets and total of current liabilities.

On the basis of time, working capital can be divided into permanent and temporary working capital. Permanent working capital is the minimum capital required to run a business even at the minimum sales level. It is required over the entire life of a business on a continuous basis so as to ensure uninterrupted production process and sales. This investment is stable in short run, but will certainly vary in the long run due to the expansion strategies undertaken by the firm. It is also known as regular working capital.

Temporary working capital is the additional amount of working capital that is required to the capacity addition that arises due to cyclical or seasonal demands. This capital is required over and above the permanent working capital. It is also called as variable working capital or fluctuating working capital.

4.5 Operating Cycle

Operating cycle starts with the procurement of raw material from the supplier. The raw material can be purchased at cash or credit. Normally the supplier gives a certain time limit for repaying the credit amount, which is called as bill payable and treated as a liability. Thereafter the purchased raw material is used in manufacturing process, which is referred as work-in-progress. After levying certain production expenses in the

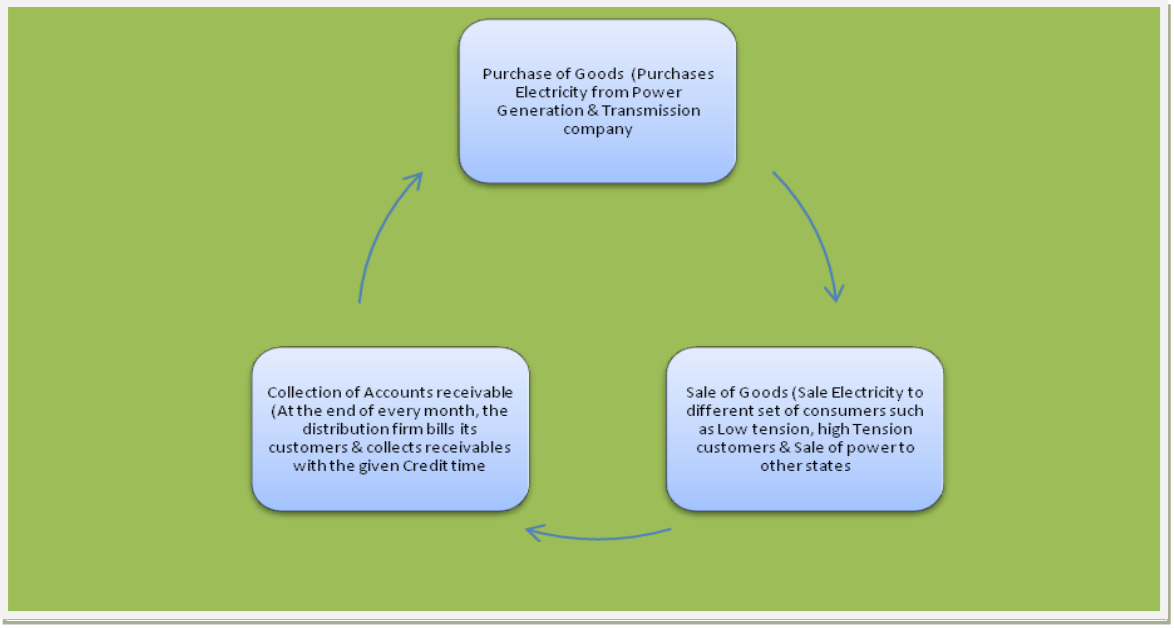
production process, the final outcome is a finished product. The finished good is sold on both credit and cash. To increase sales, a certain proportion of goods are gold on credit, which transform into debtors, which can be collected after a certain period of time. The time lag between the sale of finished goods and collection of cash after the sale is called as account receivable period whereas the time lag between the purchase of raw material and sale of the final product is called as inventory period.

Operating and Cycle is the sum of the inventory period and accounts receivable period. From the procurement of raw material to the collection of cash on sales, the time period is called as operating cycle. It is also called as gross operating cycle. Normally accounts payable period is longer than the accounts receivable period. In general, firms always extend their payments to creditors and fasten their collections from consumers. There is a difference in the operating cycle of manufacturing and non-manufacturing firms.

4.6 Operating Cycle of a Non-Manufacturing Firm

The Non-Manufacturing firms do not produce goods rather purchase finished product or good from the manufacturing firms. Non-Manufacturing firms consist of Retailers, Whole sellers, Service firms, public or state-owned enterprises such as transport service, power etc. The purchased finished product or service is sold either on cash basis or credit basis. In a business such as restaurant business, cash is received after the service is delivered. But in the case of power distribution companies, electricity is supplied to both domestic and non-domestic consumers for commercial and non-commercial use. The electricity is supplied over a period of one month and later the due amount is billed to the respective consumers based on the usage. The Figure (4.1) below depicts the operating cycle of a non-manufacturing firm.

Figure No. 4.1: Operating Cycle of a Power Distribution Utility



The operating cycle of a Power Distribution Utility Consists of:

1. Purchase of Goods
2. Sale of Goods / Service
3. Collection of Accounts Receivable

4.7 Duration of Operating Cycle

The duration of operating cycle is calculated by using the formula O = R + W + F + D – C

Where,

O = Duration of Operating Cycle.

R = Raw Material Storage Period.

W= Work-in-Progress Period.

F= Finished Goods Storage Period.

D=Debtors Collection Period.

C = Creditors Payment Period.

4.8 Cash Conversion Cycle

The Cash Conversion Cycle (CCC) is used as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchases of raw materials and the collection of sales of finished goods (Padachi, 2006).

4.9 Structure of Working Capital

The components of current assets and current liabilities comprise of the "Structure of working capital." The table below shows all the components of current assets and current liabilities. The Table No.4.1 below depicts the structure of current assets and current liabilities of power distribution utility.

Table No.4.1: Structure of Current Assets & Current Liabilities

Current Liabilities	**Current Assets**
Sundry Creditors (Net)	Interest accrued on investments
For Others i) APCPDCL P & G Trust ii) Discom GPF Trust iii) Creditors for Expenses (Net) iv) Entry Tax v) TDS vi) Employee Liabilities vii) Other Liabilities	Inventories: Stores and Spares **Add:** Materials stock (Excess) / Shortage pending investigation **Less:** Provision for Recovery / Write Off of Cost of Materials
Security and Other Deposits Security Deposits from Consumers Payable to DISCOMs (Net) Payable to Government of Andhra Pradesh Interest Accrued but not due	Sundry debtors Outstanding for a period exceeding 6 months Other Debts
Provisions a) Provision for Leave Encashment b) Provision for Gratuity c) Provision for Income Tax	Other receivables a) From Government of Andhra Pradesh
DATA MIGRATION ACCOUNTS	**CASH AND BANK BALANCES** a) Cash Balance on Hand b) Balance with Scheduled Banks
	LOANS AND ADVANCES

Source: Compiled by Author

4.10 The Components of Current Assets

The component of current assets consists of inventory, receivables, and cash in hand and bank. The structure of current assets varies from firm to firm and industry to industry. In few Industries the maximum share of working capital is contributed by inventories whereas, in some other industries receivables constitute the maximum share.

4.11 Inventory

The Stock of raw material, work-in-progress and finished goods is generally called as Inventory. "Inventory may be defined as the material which is either saleable in the market or usable directly or indirectly in the manufacturing process and it also includes the items which are ready for making finished products by some other process or by composing them either by the concern itself and or by the other parties" (Mishra, B.K, 1989). It is a tangible good. It indicates all physical stocks which are lying in the stores.

The objective of the Inventory is to carry business without any stoppage or breaks. So it is utmost important to maintain an optimal level of inventory with minimum costs. In the case of under-stock, the firm may not be able to carry its routine business and will disrupt the production process. In the case of high level of stock than the required safety level, it will increase the cost of acquiring and holding the stock in stores. There is a need to maintain a trade-off between carrying cost, ordering cost and stock-out cost.

The inventory in power distribution is used to support continuous supply of electricity to consumers. In power distribution utility inventory comprises of Stores and Spares.

4.12 Accounts Receivable

It is the amount that the firm owes from the consumers who seeks credit for the purchase of goods or service in the ordinary course of business with an obligation to pay later on or before the assigned due date. Most of the firms grant credit to boost their revenues. In power supply industry, the consumers pay their bills after the usage of

electricity for a period of one month. In such case the consumer should pay their bills on or before the due date. In case they fail to fulfill their obligation, they are forced to pay penalty. Therefore the firms should ensure that the debts are collected on time and avoid unnecessary cost of maintaining the debtors in the course of business.

In a power distribution utility, accounts receivable consists of commercial and non-commercial consumers, loans and advances to employees etc.

Accounts receivable have the following objectives:

a) Sundry debtors should be at the optimal level
b) Its realization must be prompt. The delay should be avoided.
c) The cost of credit and the realization of must be least.

4.12.1 Customers of Power Distribution Companies

The customers of power distribution utilities comprise of both commercial and non-commercials. They comprise of individuals, institutions and business organizations. The customers have been divided on the basis of supply of electricity. The utility charges different prices for a different set of customers based on the economic usage. The following are the classification of customers based on usage:

4.12.1.a Low Tension Customers

1. Domestic
2. Non-Domestic
3. Industrial (L.T)
4. Cottage Industries
5. Agriculture
6. Public Bodies / Local Bodies
7. General Purpose
8. Temporary

4.12.1.b High Tension Customers

1. Industrial Segregated Category
2. Industrial Non- Segregated Category

3. Irrigation and Agriculture Category
4. Railway Traction Category
5. Township and Residential Colonies Category
6. RESCOS
7. Temporary Supply

Revenue from Sale of Power to Others

(Discom to Discom, Interstate & UI Sales)

4.13 Debtors Management in Power Distribution utility

The process of debtor management consists of six steps.

Figure No. 4.2: Process of Debtors Management

4.13.1 Energy Delivery

Electricity is provided to the consumers. The consumers can be domestic, industrial or government.

4.13.2 Meter Reading

At the beginning of every month, a representative of the power distribution utility visits the consumer at the doorstep and checks the meter reading at the spot.

4.13.3 Bill Preparation

Once the meter is checked, the consumption of electricity units is recorded by knowing the difference between the current month and preceding month reading.

4.13.4 Bill Distribution

After the meter reading is recorded and the bill is prepared. The bill is delivered on the spot to the consumer.

4.13.5 Collection

There are many options for making payments for usage of electricity. The consumer can make payment to the representative of DISCOM who delivers the bill or he can pay at e-seva center or online payment. Normally time duration is allotted for making payments. In case the consumer does not pay during the specified time period, a penalty is levied for late payments.

4.13.6 Credit Control

To control credit, the utility has to control and monitor the defaulter. The control and monitor of debtors can be discussed below:

4.14 Control of Receivables

The toughest thing in account receivable management is to control the receivables. Some customers pay their bills on time and some make payments after the due date and a few do not pay at all. The problem arises with the last set of customers who pay their bills after due date and default customer. Therefore controlling of receivables is more important because there is a cost associated with the late payments and default customers who do not pay at all. Therefore the financial manager should formulate an efficient collection policy to reduce late payments and avoid default risk.
Collection Policy should include the following questions:

a) How does your firm collect receivables?

b) What are the procedures followed to follow up default customers?

c) What is the procedure followed for dealing with doubtful debts?

4.15 Monitoring of Default Consumers

The receivables can be managed by using simple ratios such as

a) Debtors turnover ratio
b) Average collection period
c) Aging schedule of debtors.

4.16 Cash

Cash is considered the most important liquid assets among all. Cash is required to meet the daily expenses of a concern. It is used to make payments to suppliers, staff, petty expenses etc. Besides for these expenses, a certain amount of cash has to be maintained at hand. The biggest challenge in managing cash is to know "what is the optimal level of cash required by a firm?" If the Financial manager can plan properly then many of the issues relating to cash management can be avoided. In broader sense cash means "Near cash assets".

4.17 Role of Cash Management

1. Eliminating idle cash
2. Depositing collections
3. Facilitating payments

4.18 Liquidity Management

The firms maintaining sufficient funds will always be available to meet all foreseen and unforeseen obligations in the future. Proper management of funds is required to maintain liquidity position of a firm. The firms should accelerate inflows and decelerate outflow of cash, so as to sustain higher cash levels in the firm to maintain liquidity position of the firm. It is rightly said that most of the firms fail due to inadequate cash levels to run the business rather than an inability to earn profits. Cash inflows can be accelerated by fastening collection from debtors as early as possible and slow down cash outflows by making payments as lately as possible without affecting the credibility position of the firm. A firm can have a trade-off between liquidity and profitability and therefore manages its working capital requirement accordingly.

4.19 Liquidity, Management Efficiency and Solvency Ratio

The current ratio, quick ratio and absolute cash ratio are liquidity ratios whereas working capital turnover ratio, average collection period, debtors turnover ratio, average payable period and creditors turnover ratio represent management efficiency. Solvency

ratio is explained by debt equity and interest coverage ratio. Profitability is explained by return on capital employed. The above ratios are explained as follows:

4.19.1Current Ratio

Current ratio is the most common technique used for analyzing the liquidity of the business. It is the most indicative of the short term debt – paying capacity of the firm. The current ratio shows the relationship between the size of the current assets and the size of the current liabilities, making it feasible to compare between two firms or industries (Gibson Charles, 2008). The management can use current ratio as a means to check the level of liquidity available with the firm. If a firm has to maintain the liquidity, the requirement of working capital is more and vice-versa. Sometimes the current ratio can be misleading when firms manipulate the data before the financial reporting dates. Hence utmost care should be taken while analyzing the liquidity position of the firm.

Current ratio has been used by researchers such as Bhayani (2004), Narware (2004), Eljelly (2004), Selvi (2005), Bhunia (2007), Chatterjee (2010), Erasmus (2010), Khan, Jawaid and Arif (2011), Saleem and Rehman (2011), Bhunia and Brahma (2011), Bunia and Khan (2011), Nandi (2012), Bhunia and Das (2012), Abbasali and Milda (2012), Ben-Caleb, Olubukunola and Uwalomwa (2013), Ajanthan (2013), Sandhar and Janglani (2013), Panigrahi (2014), Chanchal (2014), Gurumurthy and Reddy, (2014).

4.19.2 Liquid Ratio

The current ratio is certainly the most indicative of overall liquidity position of the firm. At times, it is desirable to know a conservative measure liquidity of a firm. The difference between the current ratio and liquid ratio is the amount of inventory involved. Inventory is considered as a slow-moving commodity or asset, which cannot be converted speedily into cash. An opinion to the quality of the receivables should help the analyst to form an opinion of the liquid ratio. Some of the previous research work highlighted liquid ratio in their respective studies. The literature indicates that Bhayani (2004), Narware (2004), Selvi (2005), Bhunia (2007), Chatterjee (2010), Nandi (2012), Khan, Jawaid and Arif, (2011), Bhunia and Brahma (2011), Saleem and Rehman (2011),

Bunia and Khan (2011), Bhunia and Das (2012), Ben-Caleb, Olubukunola and Uwalomwa, (2013), Ajanthan, (2013), Sandhar and Janglani, (2013), Panigrahi (2014), Chanchal (2014) have used this specific ratio in research work at different point of times.

4.19.3 Absolute Cash Ratio

It is the most conservative form to measure the liquidity position of a firm. It indicates the amount of cash or cash equivalent available with the firm to pay its short-term debt. This ratio is derived by dividing the cash and marketable securities and current liabilities. Inventory and receivables are not included in this ratio. The quality of the receivables is sometimes not ascertained, and the probability of receiving all the receivable from consumers is not possible. Hence only cash is considered in such case.

The previous research studies which have used absolute cash ratio in their study are Vijayakumar and Venkatachalam, (1995), Narware (2004), Bhunia (2007), Saleem and Rehman (2011), Bhunia and Brahma (2011), Nandi (2012), Sandhar and Janglani (2013), Panigrahi (2014).

4.19.4 Debtor Turnover Ratio

Debtor's turnover ratio is a measure used to measure a firm's effectiveness in extending credit as well as in collecting debts. It is an efficiency ratio to measure the efficiency of the firm in using its assets. It evaluates how many times a business can collect its average accounts receivable within one financial year. Since this ratio is a measure of efficiency, the sooner the collections of receivables, indicating those firms are efficient in terms of collecting dues. The firms which are efficient in the collection of receivables tend to make timely payment of dues to its creditors. Since receivables and inventories are used as collateral security to procure loans from financiers, hence the quality of debtors is important to the firms.

Shin and Soenen (1998), Deloof (2003), Bhayani (2004), Narware (2004), Shah and Shah (2006), Reheman and Nasr (2007), Juan and Martinez (2007), Lazaridis and Tryfonidis (2007), Vishnani and shah (2007), Falope and Ajilore (2009), Mathuva (2009), Ben-Caleb, Olubukunola and Uwalomwa, (2013), Chatterjee (2010), Banerjee (2010), Dong and Su (2010), Danuletiu (2010), Enqvist, Graham and Nikkinen, (2010),

Mittal, Kumar and Bhavet (2010), Karaduman, Akbas, Ozsozgun, and Durer, (2010), Sharma and Kumar (2011), Seeger, Locker, and Jergen (2011), Afeef (2011), Saran (2011), Nandi, (2012), Bagchi and Khamrui (2012), Panigrahi (2014), Chanchal (2014)

4.19.5 Creditors Turnover Ratio

Creditor arises when the purchases are made on credit basis and dues are paid later. The firms can either pay timely or delay payments to its suppliers depending on the creditor policy of the firm. The gap between the purchase and payment of dues is called age of creditors measured in days. The same can be calculated in ratio form by dividing the number of days in a year by age of creditors. This is called as creditor's turnover ratio. It is used to determine the promptness with the firm makes payment to its creditors. A quick payment to creditors is indicated by low creditor's turnover ratio whereas slow payment to creditors is indicated by high creditor's turnover ratio. Timely payment of dues to creditors will increase the goodwill value of the firm. Hence it creates a positive image in the market.

These are some of the previous research works which have used creditors' turnover ratio to understand the credit policy of the firm. Few of the research studies which used this ratio are Shin and Soenen (1998), Deloof (2003), Bhayani (2004), Narware (2004), Shah and Shah (2006), Reheman and Nasr (2007), Juan and Martinez- (2007), Lazaridis and Tryfonidis (2007), Falope and Ajilore (2009), Mathuva (2009) , Vishnani and shah (2007), Chatterjee (2010), Banerjee (2010), Dong and Su (2010), Danuletiu (2010), Enqvist, Graham, and Nikkinen, (2010), Mittal, Kumar and Bhavet (2010), Karaduman, Akbas, Ozsozgun, and Durer, (2010), Afeef (2011), Sharma and Kumar (2011), Seeger, Locker and Jergen (2011), Nandi (2012), Bhunia and Das (2012), Bagchi and Khamrui (2012), Panigrahi (2014), Chanchal (2014).

4.19.6 Debt to Equity Ratio

Debt to equity ratio is an indicator of the capital structure of a firm. It is used to measure the long-term financial risk of the firm. It measures the relationship between the total liabilities to owner funds. In other words, it explains the association between the amount of debt financing and equity financing.

Few of the studies which used debt equity ratio to explain solvency are Nand Kishore Sharma (2002), Darling Selvi (2005), Bagchi and Khamrui (2012), Sandhar and Janglani (2013), Panigrahi (2014).

4.19.7 Interest Coverage Ratio

Interest coverage ratio measures the capacity of the firm to meet its payment of interest from earnings before interest and tax. It is used as a measure of company's earnings relative to the amount of interest that it pays its lenders. A higher ratio indicates a better ability of the company to repay its interest obligations from operating earnings and vice versa. The firms with higher ratio can drop significantly if the economy enters recession and in case the two firms have the same interest coverage ratio; it can be viewed differently in terms of risk (Damodara, 2012). The previous studies also provide literature on the use of interest coverage ratio and its impact on profitability. They are research studies namely Sahu, (2000), Mahajan and Sarkar (2007), Ajanthan (2013), Bagchi and Khamrui (2012) and Panigrahi (2014).

4.19.8 Return on Capital Employed

Return on capital employed is defined as the rate of margin per unit of capital employed. It is one of the most important performance and profitability indicators. It represents the earnings before interest and tax. The financial mix between debt and equity determines the tax payable. Therefore it is excluded in the calculation of this specific ratio because the amount of tax payable is determined by the factors that are outside the control of the management. It also helps in better comparison of profitability between two companies.

There are few studies which have used return on capital employed as a proxy for profitability. There are few research studies by Bunia and Khan (2011), Bhunia and Brahma (2011), Abbasali and Milda (2012), Sandhar and Janglani (2013), Panigrahi (2014).

4.20 Working Capital Practices

The first comprehensive survey of working capital practices was conducted in 1978 (Smith and Sell, 1980). Their survey instrument consisted of 35 questions, some of which asked the respondents to choose one answer among several possibilities, while the others asked the respondents to rank alternatives in terms of their relative importance to the respondent's firm. Using the same questionnaire, a survey was replicated a decade later in 1988 (Belt and Smith, 1992). The survey instrument was expanded to 38 questions and was sent to a sample of 105 usable responses of the largest U.S. industrial firms. Further using the same instrument, another survey was conducted in Australia during the year 1989. The sample consisted of 144 of the largest Australian firms, and only 39 usable responses were received.

Burns and Walker (1991) have conducted a Survey of Working Capital Policy among Small Manufacturing Firms. Burns and Walkers have used 36 questions in their survey while 35 questions related to working capital practices.

In the year 1991, Smith and Belt conducted a survey in comparisons of working capital practices in Australia and the United States. The study found that U.S was far better than Australia in terms of inventory, credit/collection, and marketable securities management. Further, Koury, Smith, and Mackay (1999) have conducted a survey to compare working capital practices in Canada, the United States and Australia to learn how smaller Canadian firms manage their working capital. The survey instrument contained 45 questions and received a total of 57 usable responses with a 15.8% response rate.

4.20.1 Working Capital Policy

It is the target levels for each current asset and how the current assets will be financed by the firm. Few studies have been conducted by Smith and Sell (1978), (1988), (1989), Burns and Walker (1991), Smith and Belt (1991), Koury, Smith and Mackay (1999). They have used these questions in a survey conducted to compare working capital practices in Canada, the United States and Australia. The survey contained questions such as nature of working capital, responsible for the formulation of working capital policy,

evaluation of working capital policy, type of working capital policy, and frequency of working capital policy.

4.20.2 Factors Effect on Working Capital Management

There are many factors which influence working capital management in businesses. The internal as well as external factors influence the operation of the firm. The firm operations require capital of both long term and short term nature. There is no clear theory or rules to determine the working capital requirement but there are numerous factors that affect the requirement of working capital. The factors change from time to time and further the factors vary within the industry and between industries. Hence the requirement of working capital fluctuates and the factors have to be identified for this specific study.

The factors influencing working capital management have been adopted from the previous research studies. Darun (2011) has cited the following variables in his doctoral research titled "the Determinants of Working Capital Management Practices: A Malaysian Perspective". The present study adopted the variables used by Darun (2011). The variables are Political situation/influence (Carey, 1949; Ketchum, 1942, 1943), Economic and business environment (Ben-Horim and Levy, 1983; Claessens et al., 2000; Herbst, 1974), Industry effects (Filbeck and Krueger, 2005; Hawawini, Viallet and Vora, 1986; Raheman, Qayyum and Afza, 2011; Smith, 1997), Legislation (Peel, et al., 2000) Competition (Filbeck and Krueger, 2005) Financing/interest rates/regulations (Cocheo, 2004; Holdren and Hollingshead, 1999; Strischek, 2001) Managerial practice / working capital policy (Boisjoly and Izzo, 2009; Deloof, 2003; Edwards, Wagner, and Wood, 1985; Fredenberger, DeThomas and Ray, 1993; García-Teruel and Martínez-Solano, 2007; Hill, et al., 2010; Johnson and Soenen, 2003; Knight, 1972; Lazaridis and Tryfonidis, 2006; Sathyamoorthi, 2002) Performance measurement system (Srisvastava, 2004), Information technology (Fairchild, 2005; Jaiswal and Kaushik, 2005), Employees' behaviours (Krishna, Dmitri and Victor, 1993; Loeser, 1988), Investment policy (Appuhami, 2009; Seidner, 1990), Production and Supply Chain management (Bartezzaghi, et al., 1992; Evans, Naim and Towill, 1993; Hamlin and Heathfield, 1991) Shareholders wealth (Filbeck, Krueger, and Preece, 2007; Pass and Pike, 1984),

Inventory management (Edwards, et al., 1985; Raman and Kim, 2002; Yang, et al., 2005), Payable management (Kolay, 1991; Rafuse, 1996), Credit policy (Kolay, 1991; Ooghe, 1998; Walia, 1977), and Employees financial knowledge (Cheatham and Cheatham, 1993; Gitman and Maxwell, 1985).

4.20.3 Working Capital Financing

The questionnaire enquired about working capital financing approach, sources of short-term finance, type of institutional finance, difficulties in procuring working capital finance of selected sample utilities. These questions are prepared by the author after discussion with the employees working in power distribution utilities. Other questions related to requirement of collateral security for obtaining loans were adopted from khoury, Smith and Mackay (1999).

4.20.4 Cash Management

Cash is an indispensable input required to keep the business going on an uninterrupted basis; it is also eventual output anticipated to be realized by selling the service or goods produced by the company (Bansal, 2013). Cash management comprises of a series of activities aimed at efficiently handling the inflows and outflows of cash. It mainly involves diverting of cash from where it is to where it is needed. In other words, cash management is the optimization of cash flows, balances and short-term investments.

The previous studies have used survey method for understanding the working capital practices. Smith and Sell (1978), (1988), (1989), Burns, and Walker (1991), Smith and Belt (1991), Khoury, Smith and Mackay (1999) have used questions such as motive behind cash holdings, preparation of cash budgeting, Frequency of cash budgeting, and strategies for managing marketable securities. Hence these questions were adopted for this study. New questions such as variance in cash budgeting on receipt and payments, strategy to optimize cash management were added by the author.

4.20.5 Receivables Management

Receivables are a component of current assets. When a firm sells its product or service on credit, account receivables are created. The receivable arise out of credit

provided to the purchaser of goods / services and involves an element of risk. The risk arises due to the nonreceipt of cash payment remains after sales. The economic value of goods and services passes to the buyer immediately but receipt of the economic value in terms of money is received later. Moreover, receivables are received in the future date, arising possibility to doubt debts and bad debts. Hence utmost care should be taken to maintain the quality of receivables, in other words, the firm should decrease the chances of bad debts and doubtful.

Receivables occupy second important place after inventories and thereby constitute a substantial portion of current assets in several firms. But in the case of utilities, receivables occupy first position among components of current assets. They constitute more than 60-70% of the current assets.

The questionnaire enquires the debtor's management in power distribution utilities. This questionnaire was prepared to obtain information on the receivables management in select power distribution utilities. The questionnaire on receivables management was prepared by discusing with employees of power distribution utilities. The questionnaire equires on the aspects of objective of debtor's management, type of recording keeping, credit criteria for granting credit, frequency of meeting to discuss debtors problems, bad debts, contribution of bad debts by each set of consumers, provision of bad debts, debtors aging schedule, effective mechanism used for collection of debtors, effective way to control defaulters, problems that hinder the efficient management of debtor's.

CHAPTER – V

DESCRIPTIVE ANALYSIS OF WORKING CAPITAL RATIOS: A STUDY OF SELECT POWER DISTRIBUTION UTILITIES IN INDIA

5.1 Introduction

Descriptive statistics is an analysis of data that enables the explanation, illustration and summarization of the data in a meaningful manner. It is imperative for the research, as the raw data is difficult to explain and interpret. Therefore, it enables us to present the data in a more meaningful, precise way and which further allows simple and clear interpretation.

The descriptive analysis of the data is presented as follows. The variables in the study are represented in the form of ratios for the period 2005-2014. The descriptive statistical tools such as minimum, maximum, averages, standard deviation and coefficient of variation were used. The following ratios were used for the study.

1) Liquidity is explained by

- Net Working Capital
- Current Ratio
- Quick Ratio
- Absolute Liquid Ratio

2) Management Efficiency is explained by

- Average collection period
- Debtors Turnover Ratio
- Average Payable Period
- Creditors Turnover Ratio
- Collection Efficiency
- Working Capital Turnover Ratio

3) Solvency Ratio is explained by

- Debt Equity Ratio

- Interest Coverage Ratio

4) Profitability is explained by

- Return on Capital Employed

5.2. Net Working Capital

Net working capital refers to an excess of current assets over current liabilities. It is a measure of both firm's efficiency and sound short-term financial health. If net working capital is positive, it signifies that the amounts of short-term assets are sufficient to meet the current liabilities as they approach. In case, current assets are greater than current liabilities, then net working capital is positive, whereas when the current assets are lesser than current liabilities, the net working capital is negative.

The net working capital can be calculated as:

Net Working Capital = Current Assets – Current Liabilities

The Table 5.1 presents the analysis of net working capital for the sample power distribution utilities considered for the period of 2004-05 to 2013-14. The minimum net working capital was recorded as -75020267702 in APCPDCL during the year 2012-13 and the maximum net working capital was recorded as 79671708599 in JDVNL during the year 2009-10. The average net working capital ranged from -12460229541 to 16336341431.

The standard deviation of the data ranged from 864177095 to 45975636180. NESCO has the lowest deviation and JVVNL has the largest deviation from the sample mean. APNPDCL has the lowest coefficient of variation, whereas HESCOM has the highest CV implicating that there is a huge variation in dispersion in maintaining net working capital. However, expect in the year 2013, APNPDCL and HESCOM maintained positive working capital. The variation is explained due to the addition of Fuel Surcharge Amount (FSA) that utilities applied on bills based on varying price of fuel or coal. The electricity generation companies weigh down this cost to distribution companies who thereby pass it on to the consumers, hence leading to increase in the level of debtors in the balance sheet of distribution utilities.

Table No. 5.1: Net Working Capital

ID	Min.	Max.	AVG.	S.D.	C.V. (%)
CESCO	-150148745	3754498923	2329938115	1187940088	50.99
NESCO	-3709374521	-782825115	-1932898216	864177095.3	-44.71
SESCO	-4852240490	-622291862	-3277362690	1448914179	-44.21
WESCO	-1125795800	2640492025	681420350	1103867530	162.00
AVG.			**-549725610**	**1264000000**	
APCPDCL	-75020267702	35362592073	-3337743958	32212532857	-965.10
APEPDCL	-14222880192	26106644977	8685425335	12364038132	142.35
APNPDCL	-33065848631	16442535429	-755953189	12498341753	-1653.32
APSPDCL	-37974409638	26459677267	4111350564	17586413702	427.75
BESCOM	1021291187	16964716509	9420238308	4362447872	46.31
GESCOM	-3094694242	3233961648	1132620568	1947194030	171.92
HESCOM	-11062622548	8520978900	935581504.4	6549714672	700.07
MESCOM	-130900000	4576174000	2814058200	1590089835	56.51
CHESCOM	-4731944000	2391053662	-404308722.2	2556346393	-632.28
DGVCL	-223197000	7457025000	2495528995	2926579024	117.27
MGVCL	-1791087000	2745739000	231918408.7	1611873566	695.02
UGVCL	-19480061000	2721312000	-1863241400	6443039167	-345.80
PGVCL	-11217652000	7532301000	-3212647856	6608262223	-205.70
MPMKVVCL	-48456500000	16817300000	-4197040667	18373267727	-437.77
MPPKVVCL	-29764236000	27219200000	-3470926750	18371059777	-529.28
MPPVKVVCL	-16061094000	-3050847000	-8890292714	5328635574	-59.94
AVVNL	-36750422947	14526405791	-12460229541	17391617441	-139.58
JDVVNL	-39333729926	79671708599	16336341431	39070001113	239.16
JVVNL	-61812050264	67688874445	-4624481781	45975636180	-994.18
AVG./SD			**353000000**	**1894000000**	

Source: Compiled from PFC and Annual Reports

Among the 23 utilities considered for the study, twelve utilities have maintained negative net working capital assets. Out of four private power distribution utilities, two utilities have negative working capital whereas two have positive working capital. The negative working capital indicates that the utilities are managing with lesser current assets in comparison to current liabilities. The negative working capital indicates that short-term liabilities are used for long term use / purpose or funds, long-term assets, abnormal loss of inventory, bad debts, consistently selling goods at loss etc. It was further found that the sample utilities were not maintaining consistent working capital over the period of the study.

5.3 Mann-Whitney U Test: Working Capital

H_1: There is a significant difference between private and state-owned power distribution utilities in the management of net working capital.

Table No. 5.2: Mann-Whitney U Test - Net Working Capital

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	11.75	47.00	37.00	-0.81	.969
19	12.05	229.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of net working capital. The results (Table 5.2) of the test indicated that $z = -0.81$, $p > .05$. The private power utilities had an average rank of 11.75, while state-owned utilities had an average rank of 12.05. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities did not differ significantly in the management of net working capital.

5.4 Current Ratio

This ratio is a measure of the firm's short-term solvency. It indicates the capacity of the company to meet its current commitment to pay its short-term liabilities

within a period of one year. The ideal current ratio is defined as 2:1, indicating a firm to maintain 2:1 times the current assets in proportion to current liabilities. If a company retains ideal ratio, it signifies good short-term financial strength of the firm. A high ratio indicates that the company is not efficient in using its current assets; on the other hand, a low current ratio is a sign of low credit worthiness of a firm to meet its short-term obligations.

The Table 5.3 shows the current ratio of sample firms in India from 2004-05 to 2013-14. DGVCL and MGVCL have the minimum current ratio of 0.02 in the year 2005 whereas JDVVNL has the maximum current ratio of 4.62 in the year 2010. DGVCL and MGVCL were setup in the year 2005; hence the cash and bank balance consists of 90% of current assets and the remaining current assets consist of other current assets.

The average quick ratio ranges from 0.39:1 to 2.19:1 for the study period. The majority of sample utilities showed an improvement in current ratio. Utilities such as BESCOM, MESCOM, JDVVNL and JVVNL have a higher current ratio of 1.5:1 as compared to other sample utilities. By the end of the sample period, all the three utilities have decreased their liquidity position. CESCO has the lowest standard deviation of 0.07 and JDVVNL has the highest standard deviation with 1.44. The coefficient of variation of current ratio ranges between 6.64 to 91.46 percent. The lowest coefficient of variation is found in CESCO and the highest coefficient of variation is found in MPPKVVCL. The higher CV indicates that the management is inconsistent in managing liquidity over the study period.

Utilities such as power distribution do not require a current ratio of 2:1. Even a ratio of 1.3:1 can be considered admirable. From the sample utilities, about six utilities namely APCPDCL, APNPDCL, APSPDCL, HESCOM, CHESCOM and JVVNL are maintaining a current ratio above 1.33. These utilities are having enough liquidity to pay its short term liabilities. The utilities which are having a current ratio less than 1 are namely NESCO, PGVCL, MGVCL, MPPVKVVCL, AVVNL and JDVVNL, are having current assets lesser than the current liabilities indicating that these firms are facing liquidity problem.

Table No. 5.3: Current Ratio

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg.	S.D	CV (%)
CESCO	0.99	1.14	1.16	1.2	1.18	1.16	1.23	1.18	1.24	NA	0.99	1.24	1.16	0.07	6.28
NESCO	0.35	0.71	0.59	0.7	0.74	0.7	0.74	0.94	0.93	NA	0.35	0.94	0.71	0.18	24.72
SESCO	0.21	0.2	0.16	0.15	0.36	0.34	0.43	0.71	0.93	NA	0.15	0.93	0.39	0.27	69.31
WESCO	0.69	1.12	0.99	1	1.05	1.01	1.12	1.22	1.11	1.08	0.69	1.22	1.04	0.14	13.58
AVG/SD													**0.82**	**0.34**	
APCPDCL	1.11	1.09	1.07	1.08	1.31	1.49	1.64	1.05	0.47	0.58	0.47	1.64	1.09	0.36	33.00
APEPDCL	1.09	1.46	1.12	1.05	1.84	1.8	2.51	1.05	0.74	1.74	0.74	2.51	1.44	0.53	36.92
APNPDCL	1.03	1.01	0.98	1.1	1.42	2.15	1.05	1.05	0.42	0.92	0.42	2.15	1.11	0.44	39.39
APSPDCL	1.25	1.14	1.21	1.25	1.87	2.1	2.01	1.17	0.48	0.92	0.48	2.10	1.34	0.51	37.97
BESCOM	1.98	1.89	1.99	1.74	1.34	1.52	1.91	1.22	1.02	1.11	1.02	1.99	1.57	0.38	23.99
GESCOM	1.24	1.36	1.3	1.25	1.03	1.13	1.1	1.03	0.97	0.91	0.91	1.36	1.13	0.15	13.31
HESCOM	1.24	1.49	1.84	1.79	1.26	1.31	0.89	0.89	0.81	0.75	0.75	1.84	1.23	0.39	32.16
MESCOM	1.67	1.91	1.72	1.67	1.39	1.31	0.98	1.02	1.51	1.63	0.98	1.91	1.48	0.30	20.58
CHESCOM	N.A	1.38	1.33	1.24	0.97	0.96	1.01	0.92	0.86	0.85	0.85	1.38	1.06	0.20	19.25
DGVCL	0.02	1.2	1.27	1	1.19	1.09	0.98	3.09	2.58	1.93	0.02	3.09	1.43	0.88	61.26
MGVCL	0.02	1.03	1.02	0.84	0.95	0.87	0.77	1.8	1.49	1.10	0.02	1.80	0.99	0.47	47.04
PGVCL	0.03	0.96	1.15	0.92	0.91	0.67	0.56	0.69	0.68	0.62	0.03	1.15	0.72	0.30	42.36
UGVCL	0.03	1.06	1.09	0.99	1.15	0.9	0.69	1.09	1.29	0.98	0.03	1.29	0.93	0.35	38.06
MPMKVVCL	N.A	0.84	0.77	0.72	0.83	0.99	0.92	1.8	1.53	0.45	0.45	1.80	0.98	0.42	42.68
MPPKVVCL	N.A	0.83	0.79	0.63	0.46	0.34	0.72	3.42	2.19	NA	0.34	3.42	1.17	1.07	91.46
MPPVKVVCL	N.A	N.A	0.82	0.67	0.57	0.66	0.71	0.87	0.87	NA	0.57	0.87	0.74	0.12	15.76
AVVNL	2.05	1.86	0.7	0.54	0.63	0.65	0.64	0.52	0.5	0.47	0.47	2.05	0.86	0.59	68.43
JDVVNL	N.A	2.27	2.43	2.69	3.76	4.62	2.21	0.74	0.48	0.51	0.48	4.62	2.19	1.44	65.66
JVVNL	2.58	2.27	2.07	N.A	N.A	2.71	1.32	0.34	0.33	0.33	0.33	2.71	1.49	1.05	70.02
AVG/SD													**1.20**	**.34**	

Source: Compiled from PFC and Annual Reports

Hence these utilities should improve current ratio to strengthen liquidity to meet current obligations. A higher current ratio indicates that the utility is leaving a relatively large amount of assets unused for purposes of reinvesting available capital to grow and enlarge its business.

DGVCL, MGVCL, UGVCL, MPMKVVCL and MPPKVVCL have improved the liquidity over the study period. During the year 2005, the current ratio was relatively low, but these utilities have efficiently improved their ability to pay short-term obligations whereas other utilities have shown a decrease in liquidity position.

5.5 Mann-Whitney U Test: Current Ratio

H_2: There is a significant difference between private and state-owned power distribution utilities in the management of current ratio.

Table No. 5.4: Mann-Whitney U Test - Current Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	6.50	26.00	16.00	-1.78	0.81
19	13.16	250.00			

A Mann-Whitney U test was conducted to test the hypothesis that private utilities and state-owned utilities have a difference in the management of current ratio. The results (Table 5.4) of the test indicated that z = -1.78, the p-value is 0.81 which is greater than 0.05. The private power utilities had an average rank of 6.50, while state-owned utilities had an average rank of 13.16. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of current ratio.

5.6 Quick Ratio

Quick assets consist of only cash and near cash assets. The quick ratio shows the credit worthiness of a firm. It measures the firm's ability to meet short-term obligations from its most liquid assets. Quick ratio measures the ability of a company to

use its near cash or quick assets to extinguish or retire its current liabilities immediately. A firm which has a quick ratio of less than 1 cannot pay back its current liabilities. The quick ratio is derived by deducting inventories from current assets, on the belief that these are not 'near cash assets'. But in seller's market inventories are also considered near cash assets. Moreover, just like a lag in the collection of Debtors, there is a long lag in the conversion of inventories into finished goods and sundry debtors.

$$\text{The Formula for quick ratio is: Quick Ratio} = \frac{\text{Quick Assets}}{\text{Quick Liabilities}}$$

The Table 5.5 shows the position of quick ratio of selected power distribution utilities in India for the period of 2004-05 to 2013-14. This shows a fluctuating trend during the study period. The minimum quick ratio is found in DGVNL with 0.02:1 and JDVVNL have the maximum level of quick ratio of 3.72:1.

The average quick ratio varies from 0.55 percent to 1.52 percent. The standard deviation of quick ratio fluctuates from 0.07 to 1.01. The coefficient of variation of quick ratio ranges from 6.64 percent to 91.43 percent. The lowest coefficient of variation is recorded in CESCO and the highest coefficient of variation is recorded in MPPKVVCL.

The utilities namely NESCO, SESCO, MGVCL, PGVCL and JDVVNL are maintaining quick ratio less than 1:1. This indicates that the short term financial portion of these utilities is not very sound. Expect the above mentioned utilities; others maintained enough quick assets as compared to current liabilities. They are having sound finance to meet the prompt current liabilities obligations. In the case of power distribution utilities, quick ratio is a better tool to measure liquidity.

Table No. 5.5: Quick Ratio

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg	S.D	CV (%)
CESCO	0.94	1.1	1.13	1.17	1.13	1.12	1.2	1.15	1.16	NA	0.94	1.20	1.12	0.07	6.64
NESCO	0.34	0.7	0.58	0.69	0.73	0.69	0.73	0.93	0.92	NA	0.34	0.93	0.70	0.18	25.08
SESCO	0.2	0.2	0.15	0.15	0.35	0.33	0.43	0.7	0.93	NA	0.15	0.93	0.38	0.27	70.53
WESCO	0.68	1.12	0.99	1	1.05	1	1.12	1.22	1.1	1.08	0.68	1.22	1.04	0.14	13.85
AVG/SD													**0.81**	**0.33**	
APCPDCL	1.08	1.07	1.02	1.04	1.29	1.48	1.6	1.03	0.46	0.55	0.46	1.60	1.06	0.36	33.51
APEPDCL	1.04	1.42	1.04	0.98	1.79	1.78	2.48	1.04	0.72	1.69	0.72	2.48	1.40	0.53	38.26
APNPDCL	0.97	0.95	0.93	1.04	1.38	2.12	1.03	1.03	0.4	0.89	0.40	2.12	1.07	0.44	40.84
APSPDCL	1.16	1.05	1.12	1.16	1.8	2.04	1.97	1.15	0.46	0.87	0.46	2.04	1.28	0.50	39.47
BESCOM	1.92	1.83	1.9	1.66	1.26	1.45	1.87	1.21	1	1.09	1.00	1.92	1.52	0.36	23.73
GESCOM	1.19	1.31	1.27	1.21	1	1.09	1.07	0.6	0.61	0.86	0.60	1.31	1.02	0.26	25.05
HESCOM	1.23	1.46	1.81	1.76	1.23	1.3	0.88	0.87	0.78	0.73	0.73	1.81	1.20	0.39	32.48
MESCOM	1.62	1.87	1.68	1.62	1.35	1.29	0.95	0.98	1.46	1.54	0.95	1.87	1.44	0.30	20.76
CHESCOM	NA	1.35	1.27	1.18	0.93	0.92	0.98	0.88	0.84	0.81	0.81	1.35	1.02	0.20	19.41
DGVCL	0.02	1.07	1.07	0.83	1.01	0.92	0.82	2.51	2	1.49	0.02	2.51	1.17	0.69	58.57
MGVCL	0.03	0.84	0.86	0.69	0.78	0.65	0.55	1.35	1.07	0.83	0.03	1.35	0.76	0.34	45.00
PGVCL	0.03	0.73	0.93	0.74	0.67	0.48	0.38	0.5	0.51	0.46	0.03	0.93	0.54	0.25	45.21
UGVCL	0.03	0.9	0.96	0.8	0.98	0.71	0.54	0.89	1.01	0.77	0.03	1.01	0.76	0.29	38.60
MPMKVVCL	NA	0.82	0.75	0.71	0.77	0.94	0.88	1.71	1.36	0.41	0.41	1.71	0.93	0.39	41.52
MPPKVVCL	NA	0.8	0.75	0.6	0.43	0.32	0.68	3.25	2	NA	0.32	3.25	1.10	1.01	91.43
MPPVKVVCL	NA	NA	0.78	0.64	0.54	0.65	0.69	0.87	0.87	NA	0.54	0.87	0.72	0.12	17.31
AVVNL	1.99	1.75	0.58	0.46	0.56	0.6	0.6	0.52	0.5	0.47	0.46	1.99	0.80	0.57	70.68
JDVVNL	NA	2.19	2.37	2.67	3.72	1.26	2.19	0.73	0.46	0.51	0.46	3.72	1.79	1.12	62.41
JVVNL	2.51	2.19	1.99	NA	NA	2.66	1.28	0.34	0.33	0.33	0.33	2.66	1.45	1.01	69.71
AVG/SD													**1.10**	**0.32**	

Source: Compiled from PFC and Annual Reports

5.7 Mann-Whitney U Test: Quick Ratio

H_3: There is a significant difference between private and state-owned power distribution utilities in the management of quick ratio.

Table No. 5.6: Mann-Whitney U Test – Quick Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	7.50	30.00	20.00	-1.46	0.016
19	12.95	246.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of quick ratio. The results (Table 5.6) of the test indicated that z = -1.46, the p-value is 0.16 which is greater than 0.05, level of significance. The private power utilities had an average rank of 7.50, while state-owned utilities had an average rank of 12.95. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of quick ratio.

5.8 Absolute Liquid Ratio

The absolute liquid ratio is an indicator of a company's short-term liquidity, also known as cash ratio. It explains how much cash is maintained to expel the current liabilities of a utility. It is one of the measures of liquidity and described as a tool to measure the absolute liquidity of the business. The ratio considers only the absolute liquidity available with the firm. The ideal absolute ratio should be 1:2. It means absolute liquid assets should be half the current liabilities.

The ratio is calculated as: Cash Ratio = Cash ÷ Current Liabilities

Table No. 5.7: Absolute Liquid Ratio

ID	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg	S.D	CV (%)
CESCO	0.11	0.13	0.12	0.11	0.11	0.12	0.15	0.16	1.18	NA	0.11	1.18	0.24	0.35	144.54
NESCO	0.05	0.17	0.21	0.35	0.24	0.29	0.3	0.3	0.21	NA	0.05	0.35	0.24	0.09	38.10
SESCO	0.07	0.07	0.08	0.08	0.07	0.08	0.09	0.1	0.11	NA	0.07	0.11	0.08	0.01	16.97
WESCO	0.19	0.26	0.28	0.3	0.33	0.35	0.36	0.34	0.31	0.33	0.19	0.36	0.30	0.05	16.69
AVG/SD													**0.21**	**0.94**	
APCPDCL	0.08	0.11	0.05	0.06	0.22	0.04	0.03	0.01	0.02	0.02	0.01	0.22	0.06	0.06	97.23
APEPDCL	0.1	0.08	0.1	0.16	0.18	0.09	0.11	0.06	0.05	0.13	0.05	0.18	0.11	0.04	38.93
APNPDCL	NA	0.06	0.06	0.15	0.23	0.16	0.08	0.04	0.02	0.08	0.02	0.23	0.10	0.07	69.92
APSPDCL	0.09	0.13	0.1	0.16	0.36	0.18	0.18	0.07	0.04	0.12	0.04	0.36	0.14	0.09	62.20
BESCOM	0.05	0.16	0.2	0.27	0.03	0.06	0.07	0.03	0.05	0.02	0.02	0.27	0.09	0.09	90.31
GESCOM	0.08	0.05	0.07	0.06	0.02	0.04	0.07	0.06	0.07	0.03	0.02	0.08	0.05	0.02	36.43
HESCOM	0.02	0.03	0.03	0.04	0.05	0.02	0.03	0.04	0.03	0.02	0.02	0.05	0.03	0.01	33.84
MESCOM	0.05	0.05	0.09	0.02	0.1	0.05	0.04	0.05	0.07	0.05	0.02	0.10	0.06	0.02	40.94
CHESCOM	NA	0.02	0.11	0.08	0.08	0.04	0.04	0.03	0.03	0.02	0.02	0.11	0.05	0.03	63.73
DGVCL	0.25	0.14	0.08	0.07	0.07	0.06	0.08	0.38	0.34	0.35	0.06	0.38	0.18	0.13	72.99
MGVCL	0.25	0.12	0.05	0.04	0.06	0.04	0.05	0.14	0.11	0.08	0.04	0.25	0.09	0.07	69.56
PGVCL	0.03	0.11	0.09	0.04	0.04	0.39	0.03	0.03	0.05	0.03	0.03	0.39	0.08	0.11	132.53
UGVCL	0.03	0.16	0.03	0.04	0.04	0.06	0.06	0.12	0.14	0.06	0.03	0.16	0.07	0.05	65.06
MPMKVVCL	NA	0.05	0.02	NA	0.02	0.04	0.15	0.29	0.17	0.07	0.02	0.29	0.10	0.10	93.72
MPPKVVCL	NA	0.03	0.04	0.05	0.02	0.02	0.1	0.42	0.25	NA	0.02	0.42	0.12	0.14	124.48
MPPVKVVCL	NA	NA	0.11	0.06	0.04	0.09	0.11	0.14	0.12	NA	0.04	0.14	0.10	0.04	36.62
AVVNL	0.02	0.03	0.04	0.05	0.04	0.04	0.02	0.03	0.14	0.02	0.02	0.14	0.04	0.04	84.32
JDVVNL	NA	0.05	0.12	0.1	0.05	0.02	0.04	0.13	0.11	0.02	0.02	0.13	0.07	0.04	60.17
JVVNL	0.04	0.05	0.1	NA	NA	0.04	0.01	0.04	0.08	0.02	0.01	0.10	0.05	0.03	63.77
AVG/SD													**0.08**	**0.37**	

Source: Compiled from PFC and Annual Reports

The Table 5.7 reveals the position of absolute cash ratio of selected power distribution utilities in India for the period of 2004-05 to 2013-14. The minimum absolute cash ratio is 0.01 and the maximum is 1.18 during the study period. The average absolute cash ratio ranges from 0.03 to 0.30 percent. HESCOM has the lowest and WESCO has the highest average absolute cash ratio respectively**.**

The standard deviation of absolute cash ratio ranges from 0.01 to 0.35. HESCOM and SESCO have the lowest standard deviation among the sample firms. Further HESCOM has the lowest average absolute cash ratio indicating that the utility has lower cash levels signifying that it has not maintained enough liquidity level during the study period. It is troublesome for any utility to continue with lower level of cash. It can lead to defaulting of payments as they come due.

The coefficient of variation of Absolute liquid ratio ranges from 16.97 percent to 144.54 percent. The lowest coefficient of variation is found in WESCO and the highest coefficient of variation is found in CESCO. WESCO has been consistent in managing cash to set out its critical liabilities, whereas CESCO is the most inconsistent in term of managing cash level over the study period.

None of the sample utilities have maintained ideal absolute liquid ratio standard of 0.5:1. The utilities are maintaining a very small portion of funds in the form of cash. Consequently, these utilities will have difficulties in managing urgent current liability obligations. The utilities operating in Gujarat, Telangana and Andhra Pradesh are performing better in terms of profitability, but still, these utilities are managing absolute liquid ratio of 0.1:1 approximately. It indicates that utilities do not wish to carry cash balance due to nature of the industry. The private power distribution utilities namely CESCO, NESCO and WESCO have a high absolute cash ratio indicating that these companies have a higher level of cash in comparison to other sample utilities.

5.9 Mann-Whitney U Test: Absolute Cash Ratio

H_4: There is a significant difference between private and state-owned power distribution utilities in the management of absolute cash ratio.

Table No. 5.8: Mann-Whitney U Test – Absolute Cash Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	19.13	76.50	9.50	-2.31	0.01
19	10.50	199.50			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of absolute cash ratio. The results (Table 5.8) of the test indicated that z = -2.31 with a p-value of 0.16 which is lesser than 0.05 level of significance. The private power utilities had an average rank of 19.13, while state-owned utilities had an average rank of 10.50. Hence, the research hypothesis is accepted. It can be concluded that private power distribution utilities and state-owned utilities differ significantly in the management of absolute cash ratio.

5.10 Working Capital Turnover Ratio

The working capital turnover ratio helps in understanding the relationship between the funds used to finance a company's operations and the revenues a company generates during the course of business. It is an indicator of efficiency of working capital. A higher working capital turnover ratio indicates that a company generates a higher amount of sales for every rupee invested in the form of working capital. In other words, a higher efficiency indicates the level of sales relative to working capital. The ratio can be calculated by

$$\text{Working capital turnover ratio} = \frac{\text{Net Sales}}{\text{Working Capital}}$$

Table No. 5.9: Working Capital Turnover Ratio

ID	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg	S.D	CV (%)
CESCO	46.02	4.37	2.26	3.78	4.29	5.01	4.61	5.80	5.90	NA	-46.02	5.90	-1.11	16.88	-15.18
NESCO	-1.26	-5.11	-3.49	-5.30	-4.58	-4.13	-4.96	-19.48	-12.28	NA	-19.48	-1.26	-6.73	5.62	-0.84
SESCO	-1.22	-1.05	-0.81	-0.75	-0.72	-0.68	-0.96	-2.78	-11.68	NA	-11.68	-0.68	-2.29	3.58	-1.56
WESCO	-6.49	22.53	-454.89	993.49	34.70	204.85	14.36	6.69	10.98	15.05	-454.89	993.49	84.13	360.17	4.28
AVG/SD													**18.5**	**2.5**	
APCPDCL	18.70	20.36	25.51	26.42	5.11	3.35	2.74	19.90	-1.69	-3.48	-3.48	26.42	11.69	11.56	0.99
APEPDCL	29.47	5.37	20.20	1.70	1.01	2.37	1.34	16.68	-3.38	3.52	-3.38	29.47	7.83	10.57	1.35
APNPDCL	46.96	93.58	-33.34	13.90	2.50	1.13	14.97	12.88	-0.82	-19.29	-33.34	93.58	13.25	35.41	2.67
APSPDCL	8.66	12.99	9.58	9.60	2.14	1.72	1.84	6.05	-1.69	-25.44	-25.44	12.99	2.55	10.86	4.27
BESCOM	3.67	3.62	3.63	4.97	9.90	7.59	4.78	10.89	105.01	16.73	3.62	105.01	17.08	31.18	1.83
GESCOM	4.96	2.71	2.56	2.87	22.65	5.54	8.21	29.65	-26.59	-9.01	-26.59	29.65	4.36	15.40	3.54
HESCOM	3.66	1.98	1.34	1.32	3.00	2.74	-9.83	-9.03	-5.79	-3.72	-9.83	3.66	-1.43	5.19	-3.62
MESCOM	3.65	2.11	1.83	2.19	3.20	3.87	-99.31	80.35	4.82	4.17	-99.31	80.35	0.69	42.70	62.19
CHESCOM	NA	5.12	NA	3.61	18.36	-13.28	93.02	-7.14	-3.53	-2.97	-13.28	93.02	11.65	34.21	2.94
DGVCL	NA	24.24	17.08	1090.25	23.72	46.34	-230.07	8.05	9.32	13.82	-230.07	1090.25	111.42	376.46	3.38
MGVCL	NA	-713.04	109.58	-16.22	-64.66	-25.40	-17.27	13.46	15.11	52.65	-713.04	109.58	-71.76	245.63	-3.42
PGVCL	NA	-66.17	18.30	-34.01	-31.29	-7.40	-5.48	-11.38	-11.95	-8.55	-66.17	18.30	-17.55	23.74	-1.35
UGVCL	NA	54.78	29.76	-318.36	23.08	-34.11	-11.85	57.64	24.90	-284.54	-318.36	57.64	-50.97	145.17	-2.85
MPMKVVCL	NA	-11.10	-5.07	-3.50	-4.68	-100.91	-9.83	1.94	3.30	-0.90	-100.91	3.30	-14.53	32.74	-2.25
MPPKVVCL	NA	-7.82	-6.96	-2.93	-1.38	-1.02	-3.77	1.65	3.10	NA	-7.82	3.10	-2.39	3.81	-1.59
MPPVKVVCL	NA	NA	-6.38	-2.68	-1.27	-1.76	-2.13	-7.93	-9.98	NA	-9.98	-1.27	-4.59	3.47	-0.75
AVVNL	1.08	1.16	-2.57	-1.96	-2.00	-1.93	-1.80	-1.20	-1.08	-1.46	-2.57	1.16	-1.18	1.28	-1.09
JDVVNL	NA	0.86	0.81	0.64	0.40	0.27	0.59	-1.16	-1.13	-2.80	-2.80	0.86	-0.17	1.25	-7.44
JVVNL	1.26	1.57	1.47	NA	NA	0.52	2.28	-0.95	-0.95	-1.20	-1.20	2.28	0.50	1.36	2.72
AVG/SD													**0.86**	**5.04**	

Source: compiled from PFC and Annual Reports

If working capital is negative, the working capital turnover ratio turns negative. It is not possible that sales are negative, only working capital can be negative which transforms the working capital turnover ratio negative. Generally, negative working capital turnover ratio is meaningless and cannot be compared across companies and does not make sense. For some companies, working capital can be near zero or negative, rendering this ratio incapable of being interpreted (Thomas, 2015).

The Table 5.9 explains the working capital turnover ratio of select power distribution utilities in India. The minimum is found in MGVCL in the year 2006 and the maximum is found in DGVCL in the year 2007. Both DGVCL and MGVCL are distribution utilities operating in Gujarat. The average ranges from -71.76 to 111.42. The utilities namely DGVCL, WESCO, BESCOM, APNPDCL and APCPDCL are highly efficient among the sample group while MGVCL, UGVCL, PGVCL, MPMKVVCL, NESCO, MPPVKVVCL, MPPKVVCL, SESCO, HESCOM, AVVNL, CESCO and JDVVNL are have negative working capital turnover ratio indicating inefficiency.

The standard deviation ranges from 1.25 to 376.42. Utilities namely JDVVNL, AVVNL, JVVNL, MPPVKVVCL, SESCO, MPPKVVCL, HESCOM and NESCO are having low variance from mean, whereas DGVCL, WESCO, MGVCL, UGVCL are have high variation from the mean. High standard deviation indicates inconsistency in managing working capital in relation to sales whereas low standard deviation indicates uniformity in managing working capital in relation to the sales. The Coefficient variation ranges from -15.18 and 62.19.

The utility with higher turnover explains maximum utilization of working capital to earn higher sales or revenue, whereas utilities with negative working capital should procure funds to improve the working capital position.

5.11 Mann-Whitney U Test: Working Capital Turnover Ratio

H_5: There is a significant difference between private and state-owned power distribution utilities in the management of working capital turnover ratio.

Table No. 5.10: Mann-Whitney U Test – Working Capital Turnover Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	11.50	46.00	36.0	-0.16	0.90
19	12.11	230.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of working capital turnover ratio. The results (Table 5.10) of the test indicated that z = -0.16 with a p-value of 0.90 which is greater than 0.05 level of significance. The private power utilities had an average rank of 11.50, while state-owned utilities had an average rank of 12.11. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of working capital turnover ratio.

5.12 Average Collection Period

The average collection period is used for evaluating credit and collection policies. It is the approximate amount of time that it takes for a business to receive its receivables, from its customers and clients. In other words, it informs us on an average how many days it takes for a utility to collect its receivables as they come due.

The average collection period can be calculated by

Average Collection Period (No. of days) = Debtors for sale of power / Revenue from sale of power X 365

In case the average collection period is increasing, it indicates that the firm is facing difficulty in collecting its dues from consumers and if the average collection is decreasing, it indicates that the firm is efficiently collecting its receivables as they come due. The low average collection is preferable for any firm. It helps in decreasing the carrying cost of debtors.

The Table 5.11 reveals the position of average collection period of selected power distribution utilities in India for the period of 2004-05 to 2013-14. DGVCL has recorded the minimum average collection period of 5 days whereas CHESCOM has recorded a maximum of 519 days during the study. The average collection period ranges from 21 days to 337 days. DGVCL and PGVCL have the lowest average collection period and are the efficient in terms of collection policy whereas CHESCOM has the highest average collection period indicating its inefficiency in managing collections. On part of management, it is unbearable credit and collection policy.

JVVNL has the lowest standard deviation with 6.20 and CHESCOM has the highest standard deviation with 105.47. Higher standard deviation means that there are huge fluctuations in terms of management efforts in collecting its debtors and inconsistency in managing its dues and vice-versa. It indicates that the management has not been putting efforts to speed up its collection.

The coefficient of variation ranges from 13.48 percent to 58.52 percent. The lowest coefficient of variation is found in JVVNL and the highest coefficient of variation is found in APSPDCL.

Among the 23 utilities, eleven are collecting their revenue within a period of 60 days. The utilities namely SESCO, APCPDCL, APEPDCL, APSPDCL, BESCOM, DGVCL, MGVCL, PGVCL, UGVCL, AVVNL, JDVVNL and JVVNL are effective in the collection of revenues from the consumers. This helps the utilities to maintain liquidity of funds and reduces the holding cost of debtors.

The utilities such as NESCO, WESCO, and APNPDCL are collecting their dues in 60 to 90 days and consequently categorized as satisfactory performers in terms of debtor's turnover ratio. CESCO, MESCOM, CHESCOM, GHESCOM, HESCOM, MPMKVVCL, MPPKVVCL and MPPVKVVCL have recorded average collection period of more than 90 days.

Table No. 5.11: Average Collection Period (In Days)

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min	Max	AVG	S.D	CV
CESCO	406	401	370	386	370	339	267	266	262	135	135	406	320	86.27	26.94
NESCO	102	106	73	57	59	54	60	72	76	81	54	106	74	18.18	24.57
SESCO	25	48	32	31	35	62	76	98	106	106	25	106	62	32.52	52.54
WESCO	77	48	44	50	49	57	70	82	78	79	44	82	63	15.17	23.93
AVG/S.D													**129**	**126.95**	
APCPDCL	70	71	102	35	24	27	32	35	38	57	24	102	49	25.19	51.29
APEPDCL	17	21	21	16	18	18	32	41	44	50	16	50	28	12.86	46.25
APNPDCL	63	66	80	59	73	75	71	74	72	85	59	85	72	7.70	10.72
APSPDCL	92	80	71	25	22	29	31	27	33	34	22	92	44	25.98	58.52
BESCOM	59	77	72	70	60	64	82	116	132	125	59	132	86	27.84	32.48
GESCOM	159	230	260	278	309	305	223	163	140	193	140	309	226	61.43	27.18
HESCOM	175	226	263	307	320	376	178	163	147	144	144	376	230	82.30	35.80
MESCOM	117	100	102	130	121	126	102	85	80	90	80	130	105	17.51	16.62
CHESCOM	NA	210	243	284	305	319	315	342	499	519	210	519	337	105.47	31.27
DGVCL	NA	18	12	8	5	32	28	35	27	27	5	35	21	10.91	51.13
MGVCL	NA	17	17	25	16	16	11	41	44	47	11	47	26	14.04	54.02
PGVCL	NA	20	17	37	30	25	18	16	13	15	13	37	21	7.93	37.38
UGVCL	NA	28	21	24	18	19	15	13	42	43	13	43	25	11.00	44.38
MPMKVVCL	NA	62	102	138	307	287	313	275	215	202	62	313	211	92.87	43.97
MPPKVVCL	NA	143	142	154	183	164	161	131	108	86	86	183	141	29.75	21.05
MPPVKVVCL	NA	112	163	193	288	292	265	225	187	174	112	292	211	61.21	29.01
AVVNL	44	46	53	32	34	36	37	37	24	24	24	53	37	9.18	25.01
JDVVNL	47	51	44	53	62	80	83	53	41	46	41	83	56	14.66	26.18
JVVNL	59	51	50	41	39	44	44	43	40	49	39	59	46	6.20	13.48
AVG/SD													**103.95**	**94.08**	

Source: Compiled from PFC and Annual Reports

Hence they are found to be ineffective in collecting their revenues firmly, due to which they are have problems in making timely payments to their creditors. Further, the utilities with higher debtor's turnover ratio will have to incur the additional holding cost of debtors and on the other hand, these utilities make a late payment to power generation and transmission companies reducing its creditworthiness in the market.

5.13 Mann-Whitney U Test: Average Collection Period

H_6: There is a significant difference between private and state-owned power distribution utilities in the management of average collection period.

Table No. 5.12: Mann-Whitney U Test – Average Collection Period

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	14.75	59.00	27.0	-0.89	0.40
19	11.42	217.00			

A Mann-Whitney U test was administered to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of average collection period. The results (Table 5.12) of the test indicated that z = -0.89 with a p-value of 0.40 which is greater than 0.05 level of significance. The private power utilities had an average rank of 14.75, while state-owned utilities had an average rank of 11.42. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of average collection period.

5.14 Debtors Turnover Ratio

Debtors turnover ratio is a measure to understand the collection policy. It indicates the speed with which debtors are collected from the consumers. A high debtors turnover ratio is perceived as optimal because the firms have a very speedy collection

mechanism. Therefore it does not take a company very long to turn its receivables into cash.

The Ministry of power has formulated an integrated rating methodology for distribution utilities. According to its report, it has assigned a weight for the efficiency of collections. The Table 5.13 shows the weight given to debtors turnover ratio. The author has converted the weight into ratio form.

Table No. 5.13: Scoring Methodology of Debtors

S. No	Parameter	Parameter (in Ratio)	Score
1.	Less than 60 days	<6.08	Efficient
2.	Between 60 and 90 days	4.05-6.09	Satisfactory
3.	More than 90 days	>4.05	Inefficient

Source: PFC Report

The formula for calculating the debtors turnover ratio is calculated as: 365/ accounts collection period in days.

The Table 5.14 provides a picture of debtor's turnover ratio for the sample power distribution utilities in India from 2004-05 to 2013-14. DGVCL has the maximum debtor's turnover ratio with 33.18 times, whereas, CHESCOM has the minimum debtor's turnover ratio with 0.70 among the sample utilities. The higher turnover indicates efficient management of debtors whereas lower turnover indicates incompetence and ineffective management of collection policy.

CESCO has the lowest average debtors turnover ratio with 0.54 percent standard deviation indicating that it has consistently maintained high collection period whereas, DGVCL has highest turnover ratio with highest standard deviation indicating large variation in the debtors collection efficiency of utilities.

The lowest coefficient of variation is found in JVVNL and DGVCL has the highest coefficient of variation. High CV indicates that large deviation from the mean and an indicator of inconsistent policy and efficiency in terms of debtors management and vice versa.

Table No. 5.14: Debtors Turnover Ratio

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min	Max	Avg	S.D	CV
CESCO	0.9	0.91	0.99	0.95	0.99	1.08	1.37	1.37	1.39	2.7	0.9	2.7	1.26	0.54	43.01
NESCO	3.58	3.44	5	6.4	6.19	6.76	6.08	5.07	4.8	4.51	3.44	6.76	5.18	1.16	22.32
SESCO	14.6	7.6	11.41	11.77	10.43	5.89	4.8	3.72	3.44	3.44	3.44	14.6	7.71	4.07	52.79
WESCO	4.74	7.6	8.3	7.3	7.45	6.4	5.21	4.45	4.68	4.62	4.45	8.3	6.08	1.49	24.53
AVG/SD													**5.05**	**2.73**	
APCPDCL	5.21	5.14	3.58	10.43	15.21	13.52	11.41	10.43	9.61	6.4	3.58	15.21	9.09	3.87	42.51
APEPDCL	21.47	17.38	17.38	22.81	20.28	20.28	11.41	8.9	8.3	7.3	7.3	22.81	15.55	5.97	38.42
APNPDCL	5.79	5.53	4.56	6.19	5	4.87	5.14	4.93	5.07	4.29	4.29	6.19	5.14	0.56	10.98
APSPDCL	3.97	4.56	5.14	14.6	16.59	12.59	11.77	13.52	11.06	10.74	3.97	16.59	10.45	4.42	42.3
BESCOM	6.19	4.74	5.07	5.21	6.08	5.7	4.45	3.15	2.77	2.92	2.77	6.19	4.63	1.29	27.77
GESCOM	2.3	1.59	1.4	1.31	1.18	1.2	1.64	2.24	2.61	1.89	1.18	2.61	1.74	0.5	28.94
HESCOM	2.09	1.62	1.39	1.19	1.14	0.97	2.05	2.24	2.48	2.53	0.97	2.53	1.77	0.58	32.81
MESCOM	3.12	3.65	3.58	2.81	3.02	2.9	3.58	4.29	4.56	4.06	2.81	4.56	3.56	0.6	17.01
CHESCOM	NA	1.74	1.5	1.29	1.2	1.14	1.16	1.07	0.73	0.7	0.7	1.74	1.17	0.33	28.17
DGVCL	NA	20.28	30.42	45.63	73	11.41	13.04	10.43	13.52	13.52	10.43	73	25.69	21.16	82.35
MGVCL	NA	21.47	21.47	14.6	22.81	22.81	33.18	8.9	8.3	7.77	7.77	33.18	17.92	8.62	48.08
PGVCL	NA	18.25	21.47	9.86	12.17	14.6	20.28	22.81	28.08	24.33	9.86	28.08	19.09	5.95	31.15
UGVCL	NA	13.04	17.38	15.21	20.28	19.21	24.33	28.08	8.69	8.49	8.49	28.08	17.19	6.64	38.61
MPMKVVCL	NA	5.89	3.58	2.64	1.19	1.27	1.17	1.33	1.7	1.81	1.17	5.89	2.29	1.57	68.75
MPPKVVCL	NA	2.55	2.57	2.37	1.99	2.23	2.27	2.79	3.38	4.24	1.99	4.24	2.71	0.7	25.8
MPPVKVVCL	NA	3.26	2.24	1.89	1.27	1.25	1.38	1.62	1.95	2.1	1.25	3.26	1.88	0.63	33.44
AVVNL	8.3	7.93	6.89	11.41	10.74	10.14	9.86	9.86	15.21	15.21	6.89	15.21	10.55	2.8	26.54
JDVVNL	7.77	7.16	8.3	6.89	5.89	4.56	4.4	6.89	8.9	7.93	4.4	8.9	6.87	1.51	22.02
JVVNL	6.19	7.16	7.3	8.9	9.36	8.3	8.3	8.49	9.13	7.45	6.19	9.36	8.06	1.01	12.48
AVG/SD													**8.70**	**7.23**	

Source: Compiled from PFC and Annual Reports

5.15 Mann-Whitney U Test: Debtors Turnover Ratio

H_7: There is a significant difference between private and state-owned power distribution utilities in the management of debtors' turnover ratio.

Table No. 5.15: Mann-Whitney U Test – Debtors Turnover Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	9.75	39.00	29.0	-.73	0.50
19	12.47	237.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of debtors' turnover ratio. The results (Table 5.15) of the test indicated that z = -0.73 with a p-value of 0.50 which is greater than 0.05 level of significance. The private power utilities had an average rank of 9.75, while state-owned utilities had an average rank of 12.47. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of debtors' turnover ratio.

5.16 Average payable Period

The Average payment period (APP) is defined as the number of days a company takes to pay off its creditors. Payments are made by distribution utilities to the generation and transmission utilities for the purchase of electricity. Credit purchases are made by distribution utilities and payments are made as they come due. A shorter payment period indicates prompt payments to creditors and longer payment period indicates delaying of payments to creditors. It is also a sign of measuring creditworthiness of the company.

According to a report by Ministry of Power (2013), the average payable period has been given weight depending on the speed of payment made to the suppliers. The table 5.16 shows weight assigned to average payable period.

Table No. 5.16: Scoring Methodology of Average Payable Period

S.No	Parameter	Score	Rating
1.	Less than 60 days	3	Highly Efficient
2.	Between 60 and 90 days	Proportionate	Efficient
3.	Equal to 90 days	0	Satisfactory
4.	Between 90 and 120 days	-1	Inefficient
5.	Between 120 and 180 days	-2	Highly inefficient
6.	More than 180 days	-3	

Source: PFC Report

The average payable period is calculated by

Creditors for purchase of Power (No. of days) = Creditors for purchase of power / Expenses for purchase of power X 365

The Table 5.17 explains that JDVVNL has the minimum average payable period with 4 days in 2008-10, whereas, CESU has the highest average payable period with 700 days in the year 2006-07. The average payable period ranges from 35 days to 325 days. JVVNL has the lowest average payable period and CESU has the highest average payable period with 325 days. MPMKVVCL has the highest variation and JVVNL has the lowest variation in terms of average payable period among the sample utilities during the study period. High payment period of the utilities indicates that they are taking full advantage of the credit terms allowed by the supplier and vice versa. The coefficient of variation ranges from 19.55 Percent and 92.26 percent. HESCOM has the lowest CV while MPMKVVCL has the highest CV.

Among the 23 companies, five utilities namely APEPDCL, BESCOM, MPPKVVCL, JDVVNL and JVVNL are making timely payments. They are efficient in making payments. Hence, they can be classified into highly efficient utilities in terms of making payments to creditors while APNPDCL, APSPDCL and AVVNL are in the category of satisfactory performers. The average payable period is between 60 to 90 days.

Table No.5.17: Average Payable Period

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min	Max	AVG	S.D	CV (%)
CESCO	507	209	700	375	337	300	217	212	201	187	187	700	325	166.44	51.29
NESCO	344	114	105	81	109	99	108	94	153	178	81	344	139	77.72	56.12
SESCO	193	270	125	54	119	121	101	75	121	160	54	270	134	61.70	46.08
WESCO	143	65	67	81	78	80	77	105	132	146	65	146	97	31.68	32.53
AVG/SD													**173**	**102.55**	
APCPDCL	95	109	69	NA	NA	76	65	152	148	118	65	152	104	33.96	32.65
APEPDCL	19	39	42	33	42	68	67	87	107	74	19	107	58	27.28	47.20
APNPDCL	106	112	77	59	66	85	66	96	116	78	59	116	86	20.41	23.71
APSPDCL	78	94	72	51	49	72	89	108	132	81	49	132	83	25.02	30.29
BESCOM	14	52	45	66	68	75	62	73	79	99	14	99	63	22.79	36.01
GESCOM	162	184	217	156	217	296	291	330	275	313	156	330	244	64.60	26.46
HESCOM	191	171	172	120	166	239	234	199	153	198	120	239	184	36.04	19.55
MESCOM	76	129	138	119	120	155	193	263	301	304	76	304	180	81.79	45.49
CHESCOM	NA	93	154	251	294	358	312	343	396	441	93	441	294	112.18	38.22
MPMKVVCL	NA	304	634	139	151	140	77	95	76	127	76	634	194	178.67	92.26
MPPKVVCL	NA	32	NA	82	76	29	NA	NA	26	48	26	82	49	24.64	50.47
MPPVKVVCL	NA	348	NA	169	211	217	169	NA	71	114	71	348	186	88.33	47.60
AVVNL	130	112	119	83	81	63	78	67	18	37	18	130	79	35.27	44.76
JDVVNL	100	122	130	13	4	4	32	68	28	33	4	130	53	48.29	90.44
JVVNL	56	27	64	21	36	25	25	49	27	19	19	64	35	15.84	45.39
AVG/SD													**126**	**80.59**	

Source: Compiled from PFC and Annual Reports

There are six utilities namely CESCO, GESCOM, HESCOM, CHESCOM, MPMKVVCL and MPPVKVVCL which are highly inefficient in terms of making payments to creditors. Due to this reason, the utilities may probably have difficulty in procuring of working capital. Further, the utilities that are making late payments might enjoy the liquidity for the delayed period.

There are two reasons due to which the payments might be delayed to creditors. Firstly, the utilities are having low debtor turnover ratio due to which they have insufficient funds leading a late payment. Second, these utilities require working capital finance and delaying payments will help in using these funds for short period without interest but this will not be viable in long run.

5.17 Mann-Whitney U Test: Average Payable Period

H_8: There is a significant difference between private and state-owned power distribution utilities in the management of average payable period.

Table No. 5.18: Mann-Whitney U Test – Average Payable Period

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	12.75	51.00	19.0	-1.10	.30
15	9.27	139.00			

A Mann-Whitney U test was conducted to test the hypothesis that private utilities and state-owned utilities have a difference in the management of average payable period. The results (Table 5.18) of the test indicated that z = -1.10 with a p-value of 0.30 which is greater than 0.05 level of significance. The private power utilities had an average rank of 12.75, while state-owned utilities had an average rank of 9.27. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of average payable period.

5.18 Creditors Turnover Ratio

This ratio explains the swiftness with which creditors are paid and ascertain a relationship between the creditors and amount paid to them. It shows the velocity of debt payment by the firm to its suppliers. According to a report by Ministry of Power (2013), the average payable period has been given weight depending on the speed of payment made to the suppliers. The table 5.19 shows weight assigned to average payable period.

Table No.5.19: Scoring Methodology of Creditors Turnover Ratio

S.No	Parameter (In term of Ratio)	Score	Rating
1.	Greater than 6.08	3	Highly Efficient
2.	Between 4.05 and 6.08	Proportionate	Efficient
3.	Equal to 4.05	0	Satisfactory
4.	Between 3.04 and 4.06	-1	Inefficient
5.	Between 2.02 and 3.04	-2	Highly inefficient
6.	Less than 2.02	-3	

Source: PFC Report

The Table 5.20 explains the creditors turnover ratio for the sample power distribution utilities from 2004-05 to 2013-14. The minimum creditors' turnover ratio is 0.52 times and the maximum is 91.25 times. The average ratio ranges between 1.34 times and 26.9 times. Highest average creditors turnover ratio is found in JVVNL and the lowest average is found in CESU. The standard deviation ranges from 0.51 to 35.14. JDVVNL has high variation in creditors turnover ratio during the study period which indicates inconsistency in payment of creditors. CESU is consistent in making payments to creditors and also has the lowest creditors turnover ratio among the sample utilities, indicating that delay in making payment to creditors. The coefficient of variation of Creditors turnover ratio ranges from 21.46 to 134.71 percent. The lowest CV is found in HESCOM indicating that the ratio is more uniform during the study period.

Table No. 5.20: Creditors Turnover Ratio

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min	Max	AVG	S.D	CV (%)
CESCO	0.72	1.75	0.52	0.97	1.08	1.22	1.68	1.72	1.82	1.95	0.52	1.95	1.34	0.51	37.63
NESCO	1.06	3.20	3.48	4.51	3.35	3.69	3.38	3.88	2.39	2.05	1.06	4.51	3.10	1.00	32.27
SESCO	1.89	1.35	2.92	6.76	3.07	3.02	3.61	4.87	3.02	2.28	1.35	6.76	3.28	1.55	47.35
WESCO	2.55	5.62	5.45	4.51	4.68	4.56	4.74	3.48	2.77	2.50	2.50	5.62	4.08	1.17	28.69
AVG/SD													**2.95**	**1.15**	
APCPDCL	3.84	3.35	5.29	NA	NA	4.80	5.62	2.40	2.47	3.09	2.40	5.62	3.86	1.25	32.40
APEPDCL	19.21	9.36	8.69	11.06	8.69	5.37	5.45	4.20	3.41	4.93	3.41	19.21	8.04	4.67	58.10
APNPDCL	3.44	3.26	4.74	6.19	5.53	4.29	5.53	3.80	3.15	4.68	3.15	6.19	4.46	1.06	23.70
APSPDCL	4.68	3.88	5.07	7.16	7.45	5.07	4.10	3.38	2.77	4.51	2.77	7.45	4.81	1.50	31.25
BESCOM	26.07	7.02	8.11	5.53	5.37	4.87	5.89	5.00	4.62	3.69	3.69	26.07	7.62	6.60	86.70
GESCOM	2.25	1.98	1.68	2.34	1.68	1.23	1.25	1.11	1.33	1.17	1.11	2.34	1.60	0.46	28.63
HESCOM	1.91	2.13	2.12	3.04	2.20	1.53	1.56	1.83	2.39	1.84	1.53	3.04	2.06	0.44	21.46
MESCOM	4.80	2.83	2.64	3.07	3.04	2.35	1.89	1.39	1.21	1.20	1.20	4.80	2.44	1.10	45.23
CHESCOM	NA	3.92	2.37	1.45	1.24	1.02	1.17	1.06	0.92	0.83	0.83	3.92	1.55	1.00	64.29
MPMKVVCL	NA	1.20	0.58	2.63	2.42	2.61	4.74	3.84	4.80	2.87	0.58	4.80	2.85	1.44	50.41
MPPKVVCL	NA	11.41	NA	4.45	4.80	12.59	NA	NA	14.04	7.60	4.45	14.04	9.15	4.10	44.85
MPPVKVVCL	NA	1.05	NA	2.16	1.73	1.68	2.16	NA	5.14	3.20	1.05	5.14	2.45	1.36	55.47
AVVNL	2.81	3.26	3.07	4.40	4.51	5.79	4.68	5.45	20.28	9.86	2.81	20.28	6.41	5.27	82.27
JDVVNL	3.65	2.99	2.81	28.08	91.25	91.25	11.41	5.37	13.04	11.06	2.81	91.25	26.09	35.14	134.71
JVVNL	6.52	13.52	5.70	17.38	10.14	14.60	14.60	7.45	13.52	19.21	5.70	19.21	12.26	4.62	37.69
AVG/SD													**6.37**	**6.30**	

Source: Compiled from PFC and Annual Reports

JDVVNL has the highest CV stating that there is a huge variation in dispersion in the efficiency of making payments to creditors. MESCOM, CHESCOM, MPMKVVCL and CESCO are inefficient in making payments to creditors.

It indicates the creditworthiness of the company. The lower creditors turnover ratio means a delay in payment to suppliers for the purchases made. It questions the credit paying ability of the firm. On the other hand, a higher ratio can be a sign of early payment. It means the utility makes it payments as per the due dates. However, firms which enjoy longer credit periods allowed by creditors usually have lower creditors turnover ratio as compared to others. Lower creditors' turnover ratio is desirable to avail the credit facility allowed by the suppliers and enjoy the benefit of interest-free financing of working capital. Utilities namely APEPDCL, BESCOM, JDVVNL and JVVNL are efficient in making their payments whereas GHESCOM, HESCOM, MESCOM, CHESCOM, MPMKVVCL and CESCO are inefficient in making payments to creditors.

5.19 Mann-Whitney U Test: Creditors Turnover Ratio

H_9: There is a significant difference between private and state-owned power distribution utilities in the management of creditor's turnover ratio.

Table No. 5.21: Mann-Whitney U Test – Creditor's Turnover Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	7.25	29.00	19.0	-1.10	.30
15	10.73	161.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of creditors turnover ratio. The results (Table 5.21) of the test indicated that z = -1.10 with a p-value of 0.30 which is greater than 0.05 level of significance. The private power utilities had an average rank of 7.25, while state-owned utilities had an average rank of 10.73. Hence, the research hypothesis is not accepted. It can be concluded that private power distribution

utilities and state-owned utilities do not differ significantly in the management of creditors turnover ratio.

5.20 Collection Efficiency

Collection efficiency is the yardstick for commercial performance of the utility. It is an index of efficiency in the realization of billings, in current and also in previous years and essentially focuses on the year-to-year movement of receivables. The collection efficiency of utilities selling directly to the consumer has to be adjusted for doubtful debts. It is calculated in terms of percentage. In case the collection efficiency is more than 100%, it indicates the utility has collected revenue for the prior period.

The collection efficiency can be calculated by using the below formula:

$$\textbf{C.E} = \frac{\textbf{Revenue from Sale of Power + Change in Debtors for Sale of Power}}{\textbf{Revenue from Sale of Power}} \times 100$$

The higher collection efficiency means better management of revenue collection via sale of electricity to consumers. Low collection efficiency indicates that the utility is unable to collect all its revenue that is pending indicating inefficiency on part of management.

The Table 5.22 reveals the collection efficiency of the selected power distribution utilities in India from 2004-05 to 2013-14. CESU has the minimum collection efficiency (75.5%) in the year 2005, whereas, SESCO has the maximum collection efficiency (108.16%) in the year 2005.

During the study period, CHESCOM has recorded the lowest average collection efficiency of 83.07 and DGVCL has recorded highest average collection efficiency of 99.72. The standard deviation of collection efficiency ranges from 0.99 to 7.52, indicating high variation of collection efficiency among the sample utilities. MGVCL has the lowest fluctuation and CESCO has the highest fluctuation in terms of collection efficiency. The coefficient of variation of Collection efficiency ranges from 1.00 percent to 12.00 percent. The lowest coefficient of variation is found in MGVCL and the highest coefficient of variation is found in MPMKVVCL.

Table No. 5.22: Collection Efficiency

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg	S.D	CV (%)
CESCO	75.50	100.57	93.91	92.18	89.20	99.06	82.17	87.14	89.51	94.11	**75.5**	100.57	90.34	7.53	8.34
NESCO	99.83	93.27	101.05	95.05	93.39	93.81	91.49	92.00	92.81	96.03	91.49	101.05	94.87	3.23	3.41
SESCO	108.16	93.15	102.15	95.12	94.63	94.29	88.59	88.47	89.34	99.69	88.47	108.16	95.36	6.37	6.68
WESCO	100.78	106.19	99.10	92.06	93.98	94.29	91.91	92.53	94.18	92.81	91.91	106.19	95.78	4.72	4.93
AVG/SD													**94.08**	**2.52**	
APCPDCL	94.81	99.07	98.53	97.46	98.24	98.37	94.4	96.71	97.52	93.51	93.51	99.07	96.86	1.95	2.01
APEPDCL	99.54	99.22	99.23	99.88	97.79	99.33	91.93	96.11	96.19	97.65	91.93	99.88	97.69	2.44	2.50
APNPDCL	96.65	103.9	95.00	96.90	98.07	95.34	97.83	96.23	100.33	91.73	91.73	103.9	97.20	3.26	3.35
APSPDCL	97.03	100.57	98.53	99.23	99.80	96.22	97.72	98.99	97.72	98.77	96.22	100.57	98.46	1.31	1.33
BESCOM	92.88	87.58	95.87	91.74	96.97	92.92	90.34	90.52	92.72	94.15	87.58	96.97	92.57	2.74	2.96
GESCOM	90.55	77.62	82.22	79.42	82.72	83.20	95.23	97.12	100.86	84.57	77.62	100.86	87.35	8.03	9.19
HESCOM	80.31	82.99	86.73	79.12	88.08	90.34	92.86	95.46	99.31	97.10	79.12	99.31	89.23	7.03	7.88
MESCOM	92.97	93.74	103.8	90.80	98.78	93.40	97.93	93.61	96.95	96.71	90.80	103.8	95.87	3.76	3.92
CHESCOM	NA	76.58	84.46	80.57	91.70	85.88	84.32	84.74	81.96	77.50	76.58	91.70	83.08	4.60	5.54
DGVCL	NA	102.49	100.09	100.24	98.40	99.97	98.89	96.74	101.31	99.39	96.74	102.49	99.72	1.66	1.67
MGVCL	NA	99.77	97.21	98.77	99.25	98.97	99.78	97.52	97.67	99.40	97.21	99.78	98.70	0.99	1.00
PGVCL	NA	98.09	96.95	99.05	98.64	99.94	98.74	96.59	99.27	98.80	96.59	99.94	98.45	1.08	1.10
UGVCL	NA	99.20	99.79	100.04	98.12	98.89	98.95	96.17	99.13	99.29	96.17	100.04	98.84	1.14	1.15
MPMKVV	NA	110.27	80.65	81.68	81.70	87.85	82.15	87.14	101.3	100.13	80.65	110.27	90.32	10.84	12.00
MPPKVV	NA	90.04	95.78	89.89	95.53	87.98	88.82	92.39	97.55	102.22	87.98	102.22	93.36	4.75	5.08
MPPVKVV	NA	89.05	74.55	92.72	70.49	80.98	90.58	92.82	85.98	85.38	70.49	92.82	84.73	7.94	9.37
AVVNL	94.89	96.17	97.55	99.13	96.79	96.59	96.03	91.86	100.95	98.30	91.86	100.95	96.83	2.46	2.54
JDVVNL	96.48	95.94	98.33	93.94	95.98	91.60	98.36	93.89	98.98	95.82	91.60	98.98	95.93	2.31	2.41
JVVNL	97.13	97.77	98.98	96.32	95.63	95.63	96.55	94.40	97.55	95.53	94.40	98.98	96.55	1.34	1.39
AVG/SD													**94.30**	**5.04**	

Source: Compiled from PFC and Annual Reports and PFC reports

The utilities namely WESCO, APSPDCL, APNPDCL, APEPDCL, MESCO, DGVCL, PGVCL, UGVCL, MGVCL, AVVNL, JDVVNL and JVVNL are having higher collection efficiency. Their collection efficiency is higher than 95%. When compared, utilities in Gujarat and Andhra Pradesh are most efficient among the sample utilities. Further, utilities namely CESCO, HESCOM, CHESCOM, MPMKVVCL and MPPVKVVCL are inefficient in terms of collection efficiency. These utilities have collection efficiency less than 90%. It indicates that 10% of the revenue is not collected on an average, leading to increase in debtors.

Low collection efficiency also means that the uncollected revenue has a cost of holding them. These utilities have to manage the cost of holding revenue / debtors, leading to higher expenses. Hence it is an indicator of inefficiency on part of management. There is a need to speed up the collection process. It is also found that few of the utilities are having collection efficiency of 100% or more. It indicates that these firms are not only collection present dues but also dues which are pending over a period of time.

5.21 Mann-Whitney U Test: Collection Efficiency

H_{10}: There is a significant difference between private and state-owned power distribution utilities in the management of collection efficiency.

Table No. 5.23: Mann-Whitney U Test – Collection Efficiency

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	9.00	36.00	26.0	-.97	0.36
15	12.63	240.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of collection efficiency. The results (Table 5.23) of the test indicated that z = -.97 with a p-value of 0.36 which is greater than 0.05 level of significance. The private power utilities had an average rank of 9.0, while state-owned utilities had an average rank of 12.63.

Hence, the research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of collection efficiency.

5.22 Debt Equity Ratio

Debt equity ratio is a measure to understand the long-term solvency of a firm. It is used to calculate the relationship between long-term debt and equity. It indicates the proportion of owners funds to total fund invested in the business. If debt element of total long-term funds employed is small, outsiders feel safe. The low ratio provides security to creditors and high ratio helps the management in trading on equity. In other words, a lower debt to equity ratio leads to financially stable business and provides safety to creditors, whereas, higher debt to equity ratio explains that the creditors are at risk because it shows that the investors have funded lesser in comparison to creditors. The table 5.24 shows the scoring methodology of debt equity ratio.

Table No. 5.24: Scoring Methodology of Debt Equity Ratio

S. No	Parameter	Score
1.	If DER is 2.33 and less	5
2.	If DER is more than 2.33 but equal to 3	3
3.	If DER is more than 3 but equal to 4	2
4.	If DER is more than 4 but equal to 5.65	1
5.	If DER is more than 5.65	0
6.	Negative Net worth	-3

Source: PFC Report

In the Table 5.25, the minimum debt equity ratio is -163.61 in BESCOM and maximum debt equity ratio registered is 104.20 in HESCOM. The study reveals an average debt equity ratio between -6.68 to 8.61 for the sample taken. The highest average debt equity ratio is found in HESCOM whereas the lowest is recorded in BESCOM. The standard deviation of debt equity ratio ranged from 0.17 to 57.4. The lowest standard deviation is recorded in NESCO and the highest standard deviation is recorded in BESCOM.

Table No. 5.25: Debt Equity Ratio

ID	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg	S.D	CV (%)
CESCO	-1.82	-1.74	-1.53	-1.29	-1.19	-1.16	-1.08	-0.98	-0.94	-0.99	-1.82	-0.94	-1.27	0.32	-25.10
NESCO	-0.71	-1.11	-0.86	-0.82	-0.69	-0.6	-0.5	-0.91	-0.82	-0.82	-1.11	-0.50	-0.78	0.17	-21.71
SESCO	-0.92	-0.75	-0.62	-0.5	-0.44	-0.41	-0.42	-0.76	-0.73	-0.73	-0.92	-0.41	-0.63	0.18	-28.13
WESCO	-1.18	-1.59	-1.38	-1.13	-1.07	-0.9	-0.92	-1.13	-0.92	-0.8	-1.59	-0.80	-1.10	0.24	-21.86
AVG/SD													**-0.94**	**0.29**	
APCPDCL	2.06	-1.92	2.41	2.74	4.34	6.11	8.57	10.43	-1.1	-1.12	-1.92	10.43	3.25	4.17	128.17
APEPDCL	5.14	5.98	4.34	4.16	5.89	6.48	9.85	9.35	-2.43	-2.43	-2.43	9.85	4.63	4.17	90.04
APNPDCL	3.06	3.17	3.42	4.07	6.29	10.25	12.15	13.44	-1.29	-1.33	-1.33	13.44	5.32	5.17	97.14
APSPDCL	2.67	2.96	3.69	3.65	6.3	8.17	9.07	10.62	-1.52	-1.53	-1.53	10.62	4.41	4.15	94.04
BESCOM	1.53	1.4	1.76	1.26	-4.32	23.95	14	7.4	-163.61	49.83	-163.61	49.83	-6.68	57.40	-859.34
GESCOM	0.84	1.88	2.79	3.79	-7.9	10.27	2.46	1.55	1.99	1.76	-7.90	10.27	1.94	4.37	225.01
HESCOM	1.49	2.27	3	3.83	-6.11	-16.84	-15.83	104.2	6.16	3.93	-16.84	104.20	8.61	34.60	401.82
MESCOM	1.99	1.06	1.27	1.08	2.02	1.78	1.62	1.93	1.57	1.85	1.06	2.02	1.62	0.37	22.60
CHESCOM	N.A	7.51	4.68	1.74	-1.65	-1.78	-3.33	-2.41	-0.99	-1.28	-3.33	7.51	0.28	3.64	1315.98
DGVCL	NA	2.15	2.05	2.04	1.23	0.99	0.53	0.34	0.38	0.35	0.34	2.15	1.12	0.78	70.00
MGVCL	N.A	2.16	1.75	1.85	1.11	1.01	0.9	0.63	0.53	0.43	0.43	2.16	1.15	0.63	54.26
PGVCL	N.A	1.29	1.41	1.38	1.07	0.88	0.63	0.41	0.84	0.51	0.41	1.41	0.94	0.38	40.16
UGVCL	N.A	1.83	1.84	1.94	1.56	1.22	0.74	0.49	0.68	0.54	0.49	1.94	1.20	0.60	50.04
MPMKVV	N.A	13.74	-2.57	-1.64	-1.54	-1.8	-2.28	-2.07	-1.82	-1.5	-2.57	13.74	-0.16	5.23	-3178.03
MPPKVV	N.A	2.51	3.98	-7.4	-2.25	-1.61	-1.81	-2.19	-1.76	-1.46	-7.40	3.98	-1.33	3.20	-240.15
MPPVKVV	N.A	5.78	-7.89	-1.92	-1.02	-1.26	-1.43	-1.51	-1.53	-1.43	-7.89	5.78	-1.36	3.43	-252.83
AVVNL	8.4	8.82	6.92	9.28	11.26	13.8	-2.56	-1.41	-1.42	-1.25	-2.56	13.80	5.18	6.17	119.08
JDVVNL	7.44	6.45	6.29	7.66	11.79	5.21	-2.27	-1.38	-1.4	-1.22	-2.27	11.79	3.86	4.98	129.08
JVVNL	7.93	7.35	7.57	9.55	9.69	10.83	-2.17	-1.41	-1.38	-1.26	-2.17	10.83	4.67	5.46	117.00
AVG/SD													**2.03**	**3.32**	

Source: Compiled from PFC and Annual Reports

The coefficient of variation of Debt equity ratio ranges from -3178.03 percent to 1315 percent. The lowest coefficient of variation is found in CHESCOM and the highest coefficient of variation is found in MPMKVVCL. Utilities have shown debt equity ratio less than 2.33 but not negative elucidating more security to the creditors. One utility has debt equity more than 3 but less than 4, while four utilities have recorded debt equity ratio of more than 4 but less than 5 and another three utilities have witnessed a debt equity ratio of higher than 5.65, explaining that these utilities provide less security to creditors and therefore they are considered riskier for investment from creditors point of view.

A negative debt equity ratio indicates that the utility has negative net worth. It means the utility can be probably in problems. The reason for negative debt equity is shown in the Appendix 4. The debt equity ratio is negative due to the fact that net worth of the utilities is negative. Debt equity ratio might find difficulty in procuring finances from bankers. Another 8 utilities have revealed a negative debt to equity ratio, which means these utilities have not been in profits.

5.23 Mann-Whitney U Test: Debt Equity Ratio

H_{11}: There is a significant difference between private and state-owned power distribution utilities in the management of debt equity ratio.

Table No. 5.26: Mann-Whitney U Test – Debt Equity Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	5.50	22.00	12.0	-2.10	.03
19	13.37	254.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of debt equity ratio. The results (Table 5.26) of the test indicated that z = -2.10 with a p-value of 0.03 which is lesser than 0.05 level of significance. The private power utilities had an average rank of 5.50, while state-owned utilities had an average rank of 13.37. Hence, the

research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of debt equity ratio.

5.24 Interest Coverage Ratio

Interest coverage ratio is used to determine how easily a company can pay interest on outstanding debt. It is calculated by dividing a company's Earnings Before Interest and Taxes (EBIT) of one period by the company's interest expenses of the same period. The interest coverage ratio is a measure of the number of times a company could make the interest payments on its debt with its EBIT. If the interest coverage ratio is higher, it indicates that the firm is highly capable of meeting its interest obligations from operating earnings. It is an indicator of sound financial health of a business.

Interest Coverage Ratio is calculated by dividing PAT + Depreciation, Amortization + Interest charged to operation by interest charged to operation. The Ministry of power has formulated a rating parameter for interest coverage ratio for the power distribution utilities. The Table 5.27 shows the rating for Interest coverage ratio.

Table No. 5.27: Scoring Methodology of Interest Coverage Ratio (ICR)

If ICR is 2 and above	Highly Efficient
If ICR is less than 2 but equal to 1.5 and above	Efficient
ICR is less than 1.5 but equal to 1.25 and above	Satisfactory
If ICR is less than 1.25	Inefficient

Source: PFC Report

The Table 5.28 shows that interest coverage ratio of power distribution utilities in India. MPPVKVVC has the minimum interest coverage ratio which is -10.40 and BESCOM has the maximum interest coverage ratio of 8.20. MPPVKVVCL has the lowest average interest coverage ratio of -4.83 and DGVCL has the highest interest coverage ratio of 2.70 during the study period.

Table No. 5.28: Interest Coverage Ratio

ID	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	Avg.	S.D.	CV (%)
CESCO	0.74	0.35	-0.38	0.38	-0.17	0.77	0.54	-1.18	-1.95	0.61	-1.95	0.77	-0.03	0.91	-3080.24
NESCO	-0.07	2.59	3.1	3.48	1.58	0.5	-0.93	-0.97	-0.36	2.69	-0.97	3.48	1.16	1.73	148.81
SESCO	-5	-0.46	-3.73	0.87	-0.31	-0.53	0.79	0.71	0.31	2.29	-5.0	2.29	-0.51	2.22	-437.84
WESCO	6.11	0.91	2.83	-0.23	2.00	0.61	0.47	0.28	-1.39	-0.20	-1.39	6.11	1.14	2.11	184.87
AVG/SD													**0.44**	**0.84**	
APCPDCL	1.77	1.8	1.94	3.01	2	1.72	1.57	1.42	-5.15	-0.28	-5.15	3.01	0.98	2.30	234.62
APEPDCL	2.49	2.62	2.47	2.24	2.39	2.08	2.04	1.82	-4.05	-0.45	-4.05	2.62	1.37	2.10	153.79
APNPDCL	2.22	2.14	2.55	2.61	2.16	1.96	1.84	1.6	-6.27	-0.26	-6.27	2.61	1.06	2.70	255.62
APSPDCL	2.26	2.48	2.58	2.31	1.97	1.8	1.84	1.72	-5.51	-0.31	-5.51	2.58	1.11	2.47	221.48
BESCOM	8.2	2.57	1.88	1.35	-3.26	1.74	1.73	2.85	-0.5	-5.70	-5.7	8.20	1.09	3.73	343.05
GESCOM	2.71	2.63	1.82	1.28	-0.77	1.2	1.74	2.3	6.49	0.35	-0.77	6.49	1.98	1.91	96.62
HESCOM	3.17	2.31	1.72	1.33	-1.62	0.66	1.08	1.47	1.45	1.01	-1.62	3.17	1.26	1.24	98.38
MESCOM	3.94	2.47	1.98	1.62	0.69	1.68	1.56	1.56	1.35	1.16	0.69	3.94	1.80	0.89	49.23
CHESCOM	NA	2.73	1.58	1.46	-1.9	0.62	1.45	0.51	-0.11	-4.64	-4.64	2.73	0.19	2.23	1175.70
DGVCL	NA	1.64	1.93	1.92	1.89	2.16	2.86	3.45	3.18	1.08	1.08	3.45	2.23	0.77	34.49
MGVCL	NA	NA	NA	NA	NA	2.31	2.71	2.91	2.86	1.02	1.02	2.91	2.36	0.79	33.34
PGVCL	NA	1.83	2.03	2.01	2.22	2.37	2.83	3.12	2.62	1.19	1.19	3.12	2.25	0.58	25.61
UGVCL	NA	1.6	1.9	2.00	1.9	2.01	2.23	2.71	2.12	1.28	1.28	2.71	1.97	0.40	20.17
MPMKVVC	NA	-6.57	-8.98	-8.1	-6.49	-5.08	-0.39	-5.48	-3.82	1.43	-8.98	1.43	-4.83	3.43	-71.02
MPPKVVCL	NA	-1.84	-0.12	-4.98	-5.1	-5.79	-0.09	-1.77	-3.85	0.46	-5.79	0.46	-2.56	2.42	-94.23
MPPVKVVC	NA	NA	-3.89	-4.69	-10.4	-6.63	-1.58	-7.27	-4.16	1.75	-10.4	1.75	-4.61	3.68	-79.93
AVVNL	1.44	1.49	1.47	1.32	1.27	1.15	-4.92	-2.7	-0.46	5.87	-4.92	5.87	0.59	2.86	482.85
JDVVNL	NA	NA	NA	NA	NA	NA	NA	-2.31	-0.77	3.00	-2.31	3.00	-0.03	2.73	-10244.73
JVVNL	1.57	1.64	1.69	NA	NA	1.24	-4.86	-2.07	-0.65	3.18	-4.86	3.18	0.22	2.61	1196.22
AVG/SD													**0.44**	**2.14**	

Source: Compiled from Annual Reports and PFC report

The standard deviation ranged from 0.26 to 3.03. The coefficient of variation ranged between -10244.73 to 1196.22 %. The huge variation in CV indicates that there is difference in the management of interest coverage among the sample utilities.

Most of the sample utilities have a decreasing trend in interest coverage ratio, negative sign, showing the company is less able to pay its interest expense with its earnings. The utilities namely GESCOM, DGVCL, MGVCL, UGCVL and PGVCL have an interest coverage of more than 2, indicating that these utilities are highly efficient in fulfilling interest obligations. About thirteen out of twenty-three utilities have interest coverage ratio less than 1.25, indicating inefficiency in managing interest charged to outstanding debt. It shows that these utilities are less able to pay its interest expense with its earnings. Further utilities such as CESCO, SESCO, MPMKVVCL, MPPVKVVCL, JDVVNL and JVVNL has negative average interest ratio. It indicates that these utilities are facing net operating loss and therefore fail to service debt. It can lead to bankruptcy. Therefore these utilities have to strengthen their financial resources to improve interest paying capacity.

5.25 Mann-Whitney U Test: Interest Coverage Ratio

H_{12}: There is a significant difference between private and state-owned power distribution utilities in the management of interest coverage ratio.

Table No. 5.29: Mann-Whitney U Test – Interest Coverage Ratio

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	9.63	38.50	28.50	-0.77	.456
19	12.50	237.50			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of interest coverage ratio. The results (Table 5.29) of the test indicated that z = -0.77 with a p-value of 0.45 which is lesser than 0.05 level of significance. The private power utilities had an average rank of 9.63, while state-owned utilities had an average rank of 12.50. Hence, the

research hypothesis is not accepted. It can be concluded that private power distribution utilities and state-owned utilities do not differ significantly in the management of interest coverage ratio.

5.26 Return on Capital Employed

Return on capital employed is one of the profitability ratios in understanding the relationship of net profit with capital employed in the utility. It describes the overall utilization of funds by the business enterprise. It reveals the efficiency of the business in the utilization of funds entrusted to it by shareholders, debenture holder and long-term liabilities. Further, it shows the earning capacity of net assets of business. Hence it is a parameter for measuring the performance of utilities.

The formula for calculating return on capital employed is as follows:

$$ROCE = \frac{\text{Earnings Before Interest and Tax}}{\text{Capital Employed}}$$

The Table 5.30 explains return on capital employed in power distribution utilities in India for the study period. The SESCO has the minimum return on capital employed -342.41 in 2006 and maximum of 79.27 in 2007. The average ROCE varies between -72.09 to 10.32. The lowest average is found in MPPKVKVVCL with -68.31 whereas the highest average is recorded in MESCOM with 10.58.

The lowest standard deviation is recorded in UGVCL explaining more consistent and less variation in managing return on capital employed whereas highest standard deviation is found in SESCO suggesting that there is a large variation in ROCE. The coefficient of variation of Return on Capital Employed ranges from -711.33 percent to 34518.87 percent. The lowest coefficient of variation is found in WESCO and the highest coefficient of variation is found in NESCO. Both the utilities are in private sector. There is huge dispersion from mean in return on capital employed during the study period. NESCO has a negative return on capital employed.

Table No. 5.30: Return on Capital Employed

Id	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Min.	Max.	AVG	S.D	CV (%)
CESCO	-8.44	-9.87	-17.08	-6.22	-13.59	-0.91	-1.25	-42.12	-55.52	-13.18	-55.52	-0.91	-16.82	17.91	-106.51
NESCO	-118.94	30.88	70.26	77.27	26.26	-0.52	-60.04	-15.14	-9.78	1.44	-118.94	77.27	0.17	58.34	34518.87
SESCO	-252	-342.41	79.27	-0.44	-9.64	-8.96	-0.03	-1.08	-14.5	23.89	-342.41	79.27	-52.59	133.47	-253.80
WESCO	-16.45	0.93	24.50	-14.43	24.74	5.57	3.71	0.13	-38.24	-17.97	-38.24	24.74	-2.75	19.57	-711.33
AVG/SD													**-17.99**	**24.22**	
APCPDCL	10.24	11.5	9.52	4.65	6.71	8.62	7.77	10.48	-262.29	6.67	-262.29	11.5	-18.61	85.64	-460.13
APEPDCL	8.56	7.25	9.34	10.46	5.45	6.53	4.78	6.69	-50.45	0.73	-50.45	10.46	0.93	18.26	1954.57
APNPDCL	5.92	7.27	5.99	5.45	5.76	5.53	5.54	7.4	-196.42	11.49	-196.42	11.49	-13.61	64.26	-472.26
APSPDCL	6.02	8.50	7.96	7.95	5.68	6.21	6.68	7.52	-119.69	0.6	-119.69	8.5	-6.26	39.92	-637.99
BESCOM	10.42	12.68	11.81	11.33	-30.49	9.60	6.80	6.36	-4.8	6.61	-30.49	12.68	4.03	13.12	325.46
GESCOM	4.52	3.45	12.54	13.08	-13.62	10.01	20.48	4.61	-11.55	7.51	-13.62	20.48	5.10	10.63	208.26
HESCOM	6.09	8.47	10.01	9.30	-19.65	4.40	10.90	15.66	15.48	-12.84	-19.65	15.66	4.78	11.74	245.55
MESCOM	8.07	9.56	12.39	9.91	1.13	11.25	10.87	12.08	17.59	12.96	1.13	17.59	10.58	4.19	39.59
CHESCOM	N.A	9.19	9.17	11.37	-50.09	3.47	27.97	4.55	-15.39	24.71	-50.09	27.97	2.77	23.45	845.98
DGVCL	N.A	8.34	7.84	5.93	5.89	7.11	9.18	8.25	5.60	6.15	5.60	9.18	7.14	1.31	18.32
MGVCL	N.A	9.33	7.29	6.11	5.58	6.35	6.33	6.75	5.44	5.64	5.44	9.33	6.54	1.20	18.42
PGVCL	N.A	8.45	6.19	5.57	4.64	5.09	4.45	4.20	5.14	6.50	4.20	8.45	5.58	1.32	23.66
UGVCL	N.A	8.74	8.01	5.63	6.58	7.10	7.24	6.50	7.80	8.44	5.63	8.74	7.34	1.01	13.72
MPMKVVCL	N.A	-35.7	-82.01	-90.47	-61.65	-45.19	-9.00	-26.96	-29.78	-56.88	-90.47	-9.00	-48.63	26.64	-54.78
MPPKVVCL	N.A	-11.24	-4.98	-39.55	-40.78	-78.3	-5.14	-10.74	-28.91	-40.36	-78.3	-4.98	-28.89	23.99	-83.05
MPPVKVVCL	N.A	-25.22	-33.13	-68.58	-270.97	-82.66	-30.34	-35.14	-30.69	-38.1	-270.97	-25.22	-68.31	78.45	-114.84
AVVNL	7.21	6.64	7.07	5.13	4.61	6.86	-53.92	-84.18	-17.03	-29.42	-84.18	7.21	-14.70	32.02	-217.79
JDVVNL	7.15	6.10	5.59	6.04	6.28	6.88	-74.39	-72.84	-25.63	-39.7	-74.39	7.15	-17.45	33.78	-193.56
JVVNL	6.47	5.19	5.25	5.65	6.35	6.35	-70.25	-61.87	-24.76	-37.58	-70.25	6.47	-15.92	30.66	-192.62
AVG/SD													**-9.34**	**20.96**	

Source: Compiled from PFC and Annual Reports

Seven utilities namely NESCO, APEPDCL, BESCOM, GESCOM, HESCOM, MESCOM, DGVCL, MGVCL, PGVCL and UGVCL have maintained a positive average ROCE for the sample period. A positive ROCE indicates efficient management, but in the case of CHESCOM the average is positive but negligible.

The utilities namely CESCO, SOUTHCO, WESCO, APCPDCL, APSPDCL, MPMKVVCL, MPPKVVCL, AVVNL, JDVVNL, and JVVNL have recorded on an average negative ROCE. During most study period, all the four private power distribution utilities operating in Odisha have negative mostly ROCE. It indicates losses and inefficiency on the part of management to run utilities efficiently.

The utilities in Andhra Pradesh have recorded positive ROCE expect in the year 2013. In this specific year fuel surcharge cost was added due to which the balance sheet showed negative ROCE therefore, keeping this point in view, they can be termed as good performers in terms of managing return on capital employed.

5.27 Mann-Whitney U Test: Return on Capital Employed

H_{13}: There is significant difference between private and state-owned power distribution utilities in the management of return on capital employed

Table No.5.31: Mann-Whitney U Test – Return on Capital Employed

Test Statistic					
N	**Rank Avg.**	**Sum of Ranks**	**Mann-Whitney U**	**Z**	**Sig.**
4	8.50	34.00	24.0	-1.13	0.28
19	12.74	242.00			

A Mann-Whitney U test was conducted to evaluate the hypothesis that private utilities and state-owned utilities have a difference in the management of return on capital employed. The results (Table 5.31) of the test indicated that z = -1.13 with a p-value of 0.28 which is lesser than 0.05 level of significance. The private power utilities had an average rank of 8.50, while state-owned utilities had an average rank of 12.74. Hence, the research hypothesis is not accepted. It can be concluded that private power

distribution utilities and state-owned utilities do not differ significantly in the management of return on capital employed.

5.28 Summary of Independent Samples - Mann-Whitney U Test

The Table No. 5.32 shows the summary hypothesis tested using Mann-Whitney U test.

Table No. 5.32 Summary of Independent Samples - Mann-Whitney U Test

Variable	Hypothesis	Sig.	Decision
Liquidity	Net Current assets	1.00	Reject
	Current Ratio	0.81	Reject
	Quick Ratio	0.16	Reject
	Absolute Liquid Ratio	0.01	Accept
Management Efficiency	Average Collection Period	0.40	Reject
	Debtors Turnover Ratio	0.50	Reject
	Average payment Period	0.30	Reject
	Creditors Turnover Ratio	0.30	Reject
	Working Capital Turnover Ratio	0.90	Reject
	Collection Efficiency	0.36	Reject
Solvency	Debt Equity Ratio	0.03	Accept
	Interest Coverage Ratio	0.45	Reject
Profitability	Return on Capital Employed	0.28	Reject

The summary shows whether there is a difference in the management of liquidity, management efficiency, solvency and profitability of private and state-owned power distribution utilities. It is found that only absolute liquid ratio and debt equity ratio shows difference in the management of liquidity and solvency in private and state-owned power distribution utilities. The test results show that there is no difference in the management of average collection period and average payable period. It is also found that the private utilities are managing better cash levels as compared to state owned utilities. In terms of collection efficiency, the state owned utilities are managing comparatively better than private owned power distribution utilities.

CHAPTER – VI

IMPACT OF WORKING CAPITAL ON PROFITABILITY: AN EMPIRICAL STUDY OF SELECT POWER DISTRIBUTION UTILITIES IN INDIA

6.1 Introduction

Liquidity is very important for sustainability and growth of a firm. It is the amount of cash a company has on hand or can generate quickly. It reveals financial health of a company. Liquidity is related to the ability of a firm to repay its short-term debt or obligations. According to Bhunia (2010), liquidity is of major importance to both the internal and the external analyst because of its close relationship with day-to-day operations of a business.

Many firms ignore its liquidity, to earn higher profits in the short run, which can worsen the business performance. This leads to business failure or financial crisis in spite of earning high profits. Therefore the firms should maintain a tradeoff between liquidity and profitability to strengthen the business and increase the efficiency. High levels of available cash indicate that the business can pay off debt easily when due date occur. It is measured by using ratios such as current ratio, liquid ratio and absolute liquid ratio. These ratios are generally used to understand the short-term liquidity of a firm.

The success of a firm mainly depends on efficient management capability of its current assets (receivables, inventories and cash) and liabilities. The effective management can ensure the success of a business while its inefficient management can not only lead to losses but also to the ultimate downfall of what might otherwise be a promising concern (Kaur and Ropar, 2013). Management efficiency is measured by two variables namely debtors turnover ratio, collection efficiency and creditors turnover ratio. It is used as a measure to understand how efficiently a firm is utilizing its current assets to improve profits. Results of the empirical analysis show that there is statistical evidence for a strong relationship between the firm's profitability and its working capital management efficiency (Shin and Soenen, 1998). In other words, efficient management

of working capital is an important component of the general strategy aiming at increasing the market value (Howorth and Westhead, 2003).

It is believed that the firms that lack liquidity can also be forced to enter bankruptcy even if it is solvent or vice-versa. Liquidity plays an important role in sustaining business in the short term and long run. Hence liquidity and management efficiency are used to measure the short-term performance of the sample firms.

6.2 Expected Relationship

The literature provides a specific relationship of independent variables with the profitability. The expected relationship can be summarized in Table 6.1. It provides the information of each variable and the expected sign that is expected from the study.

Table No. 6.1: Relationship between Working Capital and ROCE

S. No.	Independent Variable	Expected Sign
1.	Quick Ratio	Negative
2.	Absolute Liquidity Ratio	Negative
3.	Debtors Turnover Ratio	Positive
4.	Creditors Turnover Ratio	Negative
5.	Collection Efficiency	Positive
6.	Interest-Coverage Ratio	Positive

Source: Author

6.3 Panel Data

Secondary data consist of both cross-sectional and time-series dimension and therefore, it is quite possible that there may be present cross-sectional effect for some of the observations (Tufail, Sidra and Amjad, 2013). The combination of both cross-section and time series data is called panel data. There are many advantages of using panel data having both cross-sectional and time series dimensions. Firstly, by combining time series and cross-section observations, panel data gives more informative data with

more variability but less collinearity among the variables. Furthermore, it provides an increased number of data points and hence generates additional degrees of freedom and more efficiency (Baltagi, 2001). Therefore it is suitable for the present study as it increases the quality and quantity of data wherein the time series is short and the number of sample distribution utilities is very small. Secondly, by incorporating information relating to cross-section and time series variables, heterogeneity is explicitly taken into account by allowing for individual-specific variables (Baltagi, 2001 and Gujarati, 2003) as panel data suggest that individuals, firms, or countries are heterogeneous. According to Baltagi (2001), if heterogeneity is not controlled, there is the possibility of running the risk of obtaining biased results. Thirdly, by incorporating information relating to both cross-section and time series variables, it can substantially reduce the problems that arise from omitted variables (Greene, 2000).

6.4 Panel Unit Root Test

Non-stationary data are volatile and cannot be modeled or forecast. The results obtained by using raw data may be spurious. It is a well-known fact that time series data are non-stationary. The presence of non-stationarity variables might produce spurious regression results (Tafri, Hamid, Meera and Omar, 2009). Standard unit root test is performed to check for the stationarity of the data before the panel data regression analysis is run. Therefore each variable of the study is subjected to panel unit root tests of ADF-Fisher unit root test. It assumes individual unit root process and uses chi-square test statistics. Stationarity test is performed for the selected sample distribution utilities in India. EViews software by default uses the Schwartz info criterion using maximum lags length selected by the method proposed by ADF Method. It was found that variables were having unit root in level, meaning that the data is not stationary.

In order to obtain consistent, reliable results, the non-stationarity data needs to be converted into stationary form. Hence the variables were stationary at 1^{st} difference. It was found that the variables are stationary at first difference. The process can be shown through running hypotheses.

The Table 6.2 below shows a summary of stationarity test of all the variables used in the study. The research hypotheses test the stationarity of variables individually. The results indicated that all the variables were found to be stationary at 5% level of significance.

Hypothesis:

The research hypotheses were used for testing Stationarity of variables.

H_0: Variables have unit root (No stationarity)

H_1: Variables have no unit root (Stationarity)

Table No. 6.2: ADF Stationary Test

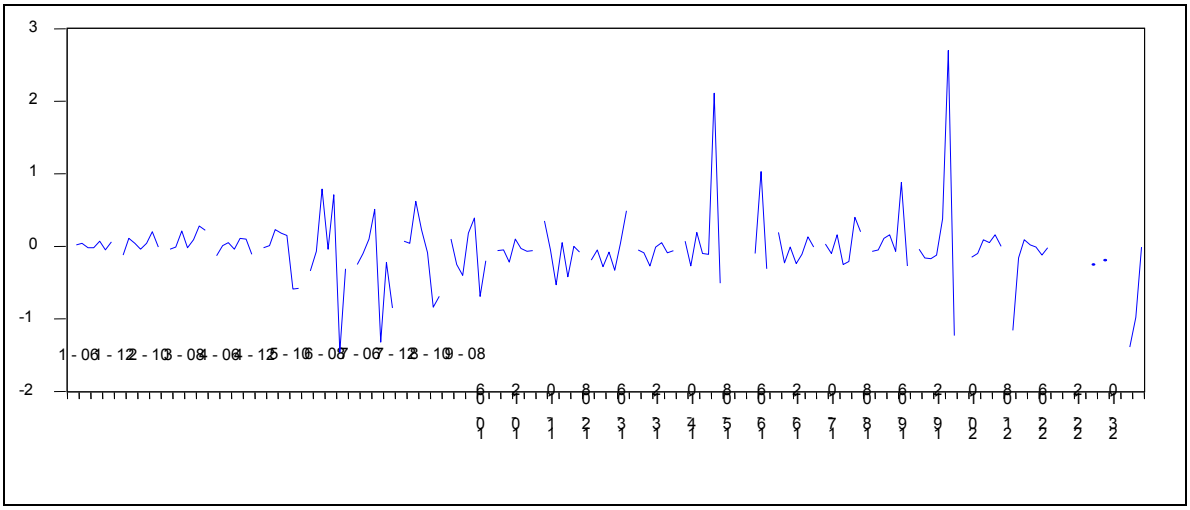
	Level		1st Difference		
Series	**Statistic**	**Prob.****	**Statistic**	**Prob.****	**Result**
Current Ratio has no unit root	55.9092	0.1075	92.2584	0.0000	Accepted
Quick Ratio has no unit root	39.1846	0.6778	91.4197	0.0000	Accepted
Absolute Liquid Ratio has no unit root	67.2219	0.0136	80.8638	0.0001	Accepted
Debtors Turnover Ratio has no unit root	92.6280	0.0001	72.7643	0.0041	Accepted
Creditors Turnover Ratio has no unit root	50.0888	0.0906	84.6577	0.0000	Accepted
Collection efficiency Ratio	104.975	0.0000	179.719	0.0000	Accepted
Debt Equity Ratio has no unit root	111.165	0.0000	100.959	0.0000	Accepted
Interest Coverage Ratio has no unit root	38.0464	0.7916	83.7744	0.0006	Accepted
Return on Capital Employed has no unit root	96.1027	0.0000	.2811	0.0001	Accepted

Source: Author

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

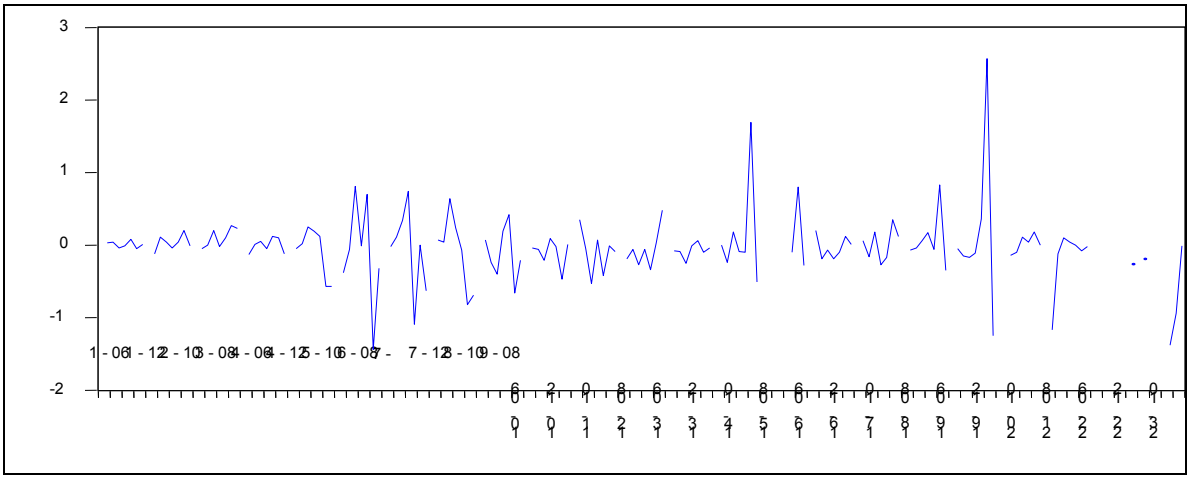
Stationarity of variables can also be seen by the graphical presentation. The study tests the stationarity by plotting the line graph at 1st-difference of all the dependent and independent variables. The Figure 6.1 shows that the series has a constant mean and constant variance which implies the first difference series of "current ratio" achieves stationarity.

Figure No. 6.1: Stationarity of Current Ratio



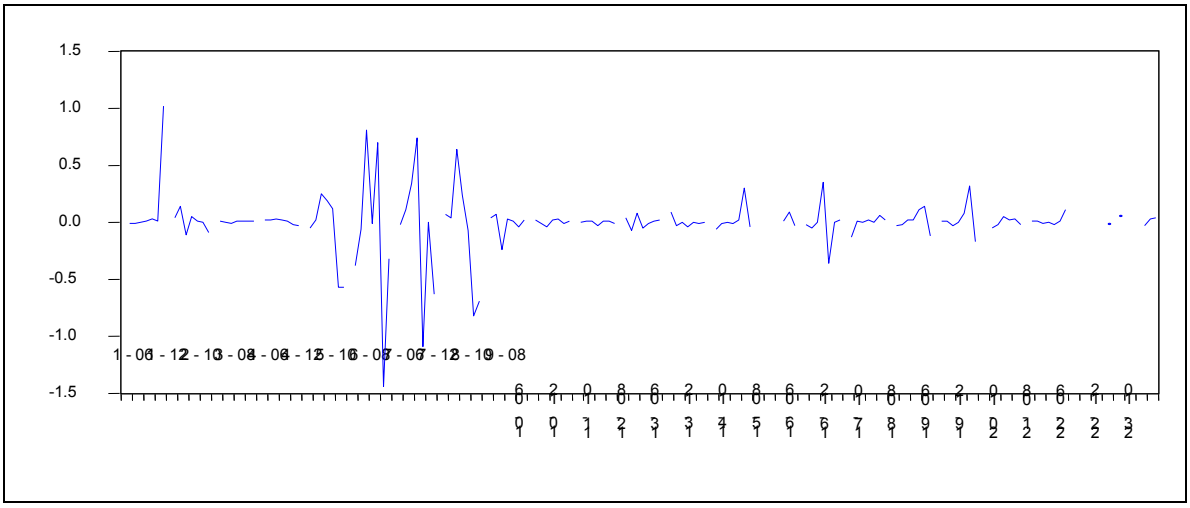
The Figure 6.2 shows that the series has a constant mean and constant variance which implies the first difference series of "quick ratio" achieves stationarity at 1st difference.

Figure No. 6.2: Stationarity of Quick Ratio



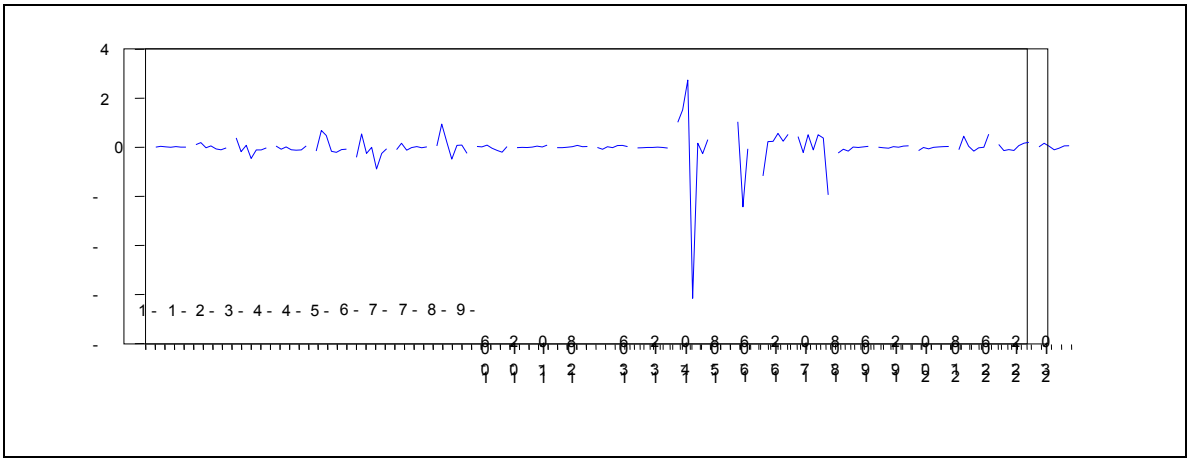
The Figure 6.3 shows that the series has a constant mean and constant variance which implies the first difference series of "absolute liquid ratio" achieves stationarity at first difference.

Figure No. 6.3: Stationarity of Absolute Liquid Ratio



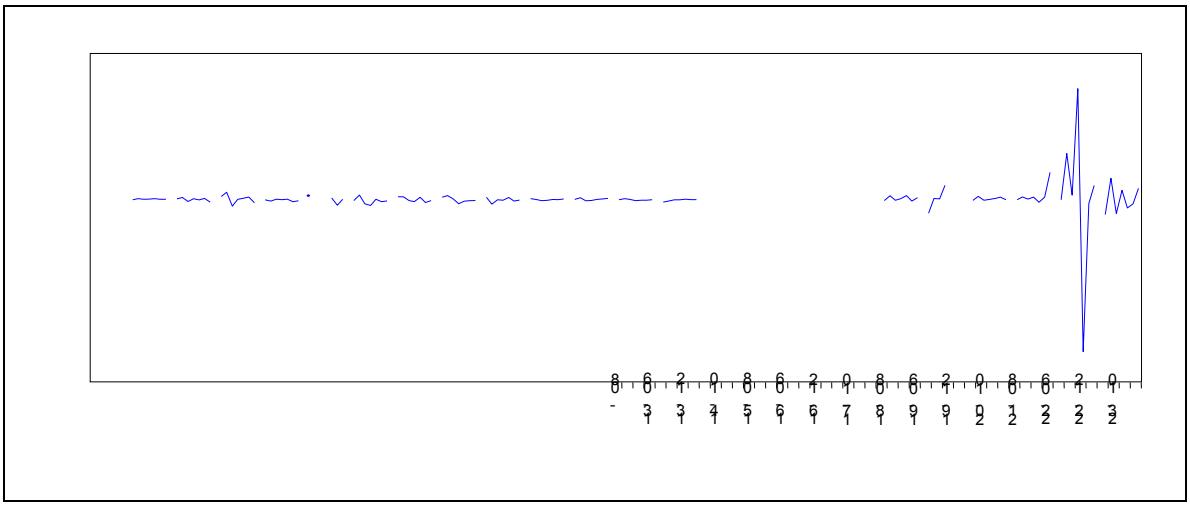
The Figure 6.4 shows that the series has a constant mean and constant variance which implies the first difference series of "debtors turnover ratio" achieves stationarity.

Figure No. 6.4: Stationarity of Debtors Turnover Ratio



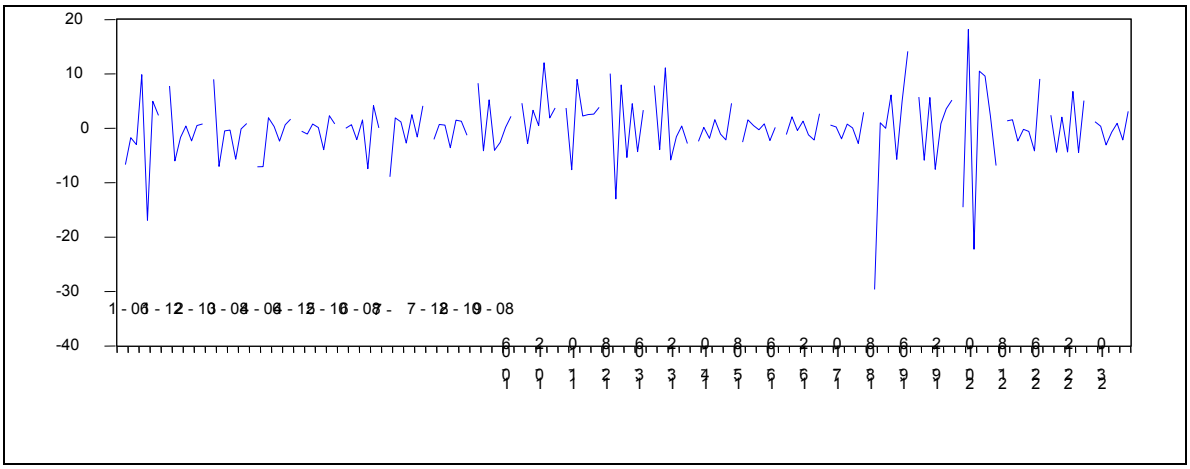
The Figure 6.5 DCTR shows that the series has a constant mean and constant variance which implies the first difference series of "creditors turnover ratio" achieves stationarity.

Figure No. 6.5: Stationarity of Creditors Turnover Ratio



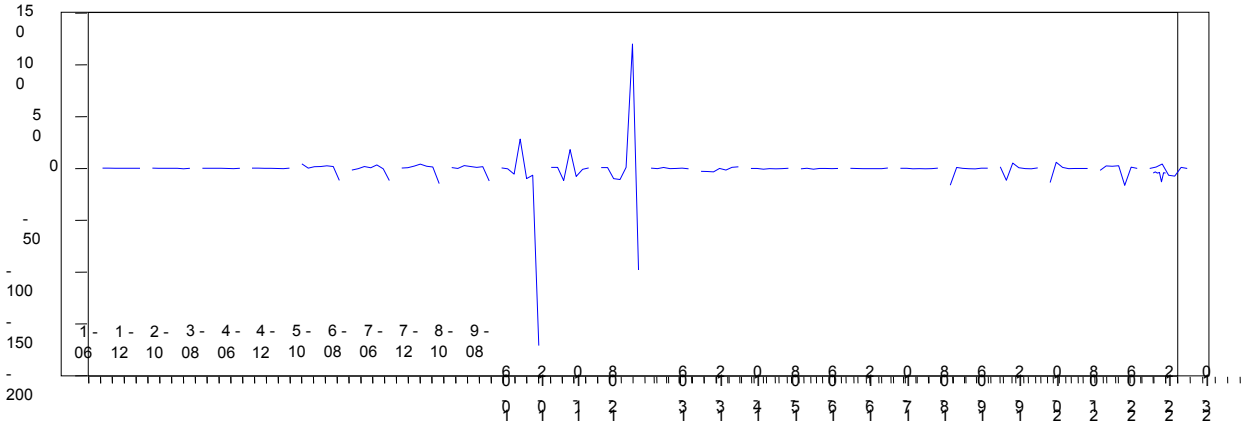
The Figure 6.6 DCE shows that the series has a constant mean and constant variance which implies the first difference series of "collection efficiency" achieves stationarity.

Figure No. 6.6: Stationarity of Collection Efficiency



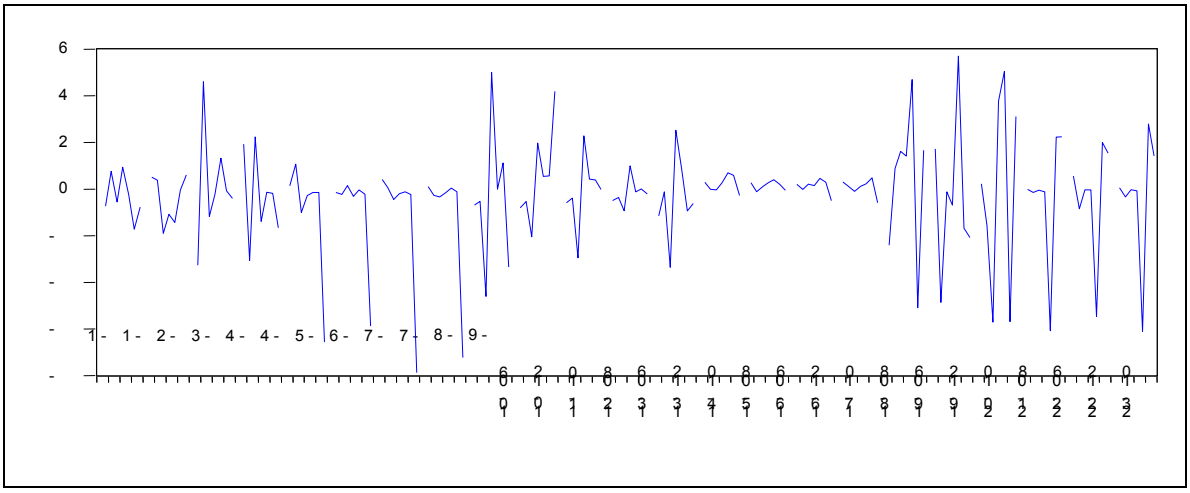
The Figure 6.7 DDER shows that the series has a constant mean and constant variance which implies the first difference series of "debt-equity ratio" achieves stationarity.

Figure No. 6.7: Stationarity of Debt Equity Ratio



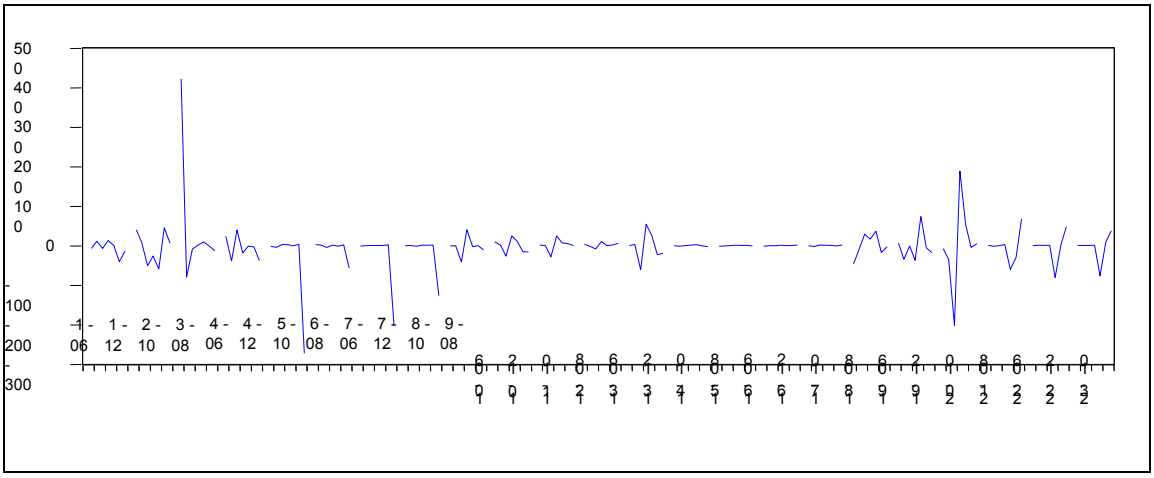
The Figure 6.8 shows that the series has a constant mean and constant variance which implies the first difference series of "interest coverage ratio" achieves stationarity.

Figure No. 6.8: Stationarity of Interest Coverage Ratio



The Figure 6.8 shows that the series has a constant mean and constant variance which implies the first difference series of "return on capital employed ratio" achieves stationarity.

Figure No. 6.9: Stationarity of Return on Capital Employed



6.5 Hausman Test

Panel data allows you to control variables. It was observed that many factors which we cannot observe in our study are omitted, and those variables change over time but not across utilities. The variables such as government policy and regulations, business practices, business agreements were not observed but change over time. These variables account for individual heterogeneity.

The Hausman test is used to identify the appropriate model to be carried out for estimation. It helps in identifying whether fixed effect model is appropriate or random effect model is appropriate. The following hypothesis is tested to verify which model is effective for this specific study.

H_0: Random Effect Model is Appropriate.

H_1: Fixed Effect Model is Appropriate.

Table No. 6.3: Correlated Random Effects - Hausman Test

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.63	6	0.8527

The null hypothesis of the Hausman test is that both estimators are consistent. Since the p-value is more than .05, we cannot reject the null hypothesis. In this specific case, it can be concluded that the random effects estimator is the most efficient model against fixed effect model.

6.6 Regression

Regression analysis is a statistical tool for studying the relationships between variables. In the regression model summary table, the capital "R-Squared" explains how close the data are to the fitted to the *regression* line. If there is a strong positive linear relationship between the variables, the value of "R-Squared" will be close to +1. If there is a strong negative linear relationship between the variables, the value of "R-Squared" will be close to-1. In case there is no linear relationship between the variables or only a weak relationship, the value of "R-Squared" will be close to 0.

6.7 Variables for the Study:

The variables in the study can be classified into dependent and independent variables and will be discussed in the next paragraph.

6.7.1 Dependent Variable

The dependent variable is explained by profitability. It is explained by return on capital employed of the sample utilities.

6.7.2 Independent Variables

The independent variables are explained by liquidity efficiency, managerial efficiency and solvency of the sample utilities. Liquidity efficiency is explained by variables such as current ratio, liquid ratio, absolute cash ratio; whereas managerial efficiency is explained by debtor's turnover ratio, collection efficiency and creditor turnover ratio. The solvency of the utilities is explained by debt equity ratio, Interest coverage ratio. Liquidity is the independent variable in this study.

6.8 Models Estimated

Multiple regression models are estimated for each of the dependent variables. The models are as follows:

ROCEit = Cit+ β1CRit+ β2QRit+ β3ACRit+ β4DTRit+ β5CTRit+ β6CEit+ β7DERit+ β8ICRit

Where

ROCE= Return On Capital Employed

CR= Current Ratio

QR=Quick Ratio

ACR=Absolute Cash Ratio

DTR= Debtors Turnover Ratio

CTR= Creditors Turnover Ratio

CE= Collection Efficiency

DER=Debt Equity Ratio

ICR=Interest Coverage Ratio

i = cross-sectional, here i=1, 2, 3, 4….Uit

t = time, here, t=1, 2, 3……..9

H_1: There is a significant impact of quick ratio on the profitability of selected power distribution utilities in India.

The t-statistic is 1.01 with a p-value of 0.31 at 5% level of significance. The coefficient is showing a positive sign with a value of 20.12 with a standard error of 1.01. The increase in quick ratio by one unit will lead to increase in profitability by 20.12 units, holding all the other independent variables constant and vice-versa. It indicates that

there is an insignificant impact of quick ratio on the profitability of the sample utilities and hence research hypothesis is rejected.

The study is consistent with previous research studies that have shown a negative relation between quick ratio and profitability (Bhunia and Das, 2012; Goswami and Sarkar, 2011; Nandi, 2012).

H_2: There is a significant impact of absolute cash ratio on the profitability of power distribution utilities in India.

The Table 6.4 shows that the t-statistic is 0.44 with a p-value of 0.65. The coefficients indicate that one unit increase in absolute liquid ratio increases profitability by 11.40 units. The research hypothesis is rejected at 5% level of significance. Therefore there is no significant impact of absolute cash ratio on profitability.

H_3: There is a significant impact of debtor turnover ratio on the profitability of selected power distribution utilities in India.

The Table 6.4 indicates that the t-statistic is 1.69 with a p-value of 0.09. The coefficient of regression indicates that one unit increase in debtor turnover ratio will lead to increase in profitability by 5.07 units. The research hypothesis is rejected at 5% level of significance. Therefore the study found a significant impact of debtor turnover ratio on the profitability of selected utilities.

The study is consistent with the previous literature found a positive relationship between debtors turnover ratio and profitability (as Deloof, 2003; Falope and Ajilore, 2009; Juan and Martinez, 2007; Lazaridis and Tryfonidis, 2007; Mathuva, 2009; Reheman and Nasr, 2007; Shin and Soenen, 1998).

The study results are not consistent with the earlier literature of (Bhunia and Das, 2012; Nandi, 2012).

H_4: There is a significant impact of creditors' turnover ratio on the profitability of selected distribution utilities in India.

The t-statistic is -0.04 with a p-value is 0.96. The coefficient of regression is showing a negative sign, indicating that delaying payments to creditors will lead to increase in profits, keeping all other independent variables constant. The finding shows an insignificant impact at 5% level of significance.Therefore the research hypothesis is rejected. It suggests that there is insignificant impact of creditors on the profitability of the sample utilities.

The results of the present study are consistent with Bhayani (2004), who found that creditors turnover has a negative impact on profitability but not consistent with that of Bhunia and Das (2012) and Nandi (2012).

H_5: There is a significant impact of collection efficiency ratio on the profitability of selected distribution utilities in India.

The t-statistic is 2.47 with a p-value is 0.0147. The coefficient indicates that one unit increase in collection efficiency ratio will improve the profitability by 2.06 units and vice-versa. The study found that there is a significant impact of collection efficiency on profitability at 5% level of significance. Therefore the research hypothesis is accepted.

H_6: There is a significant impact of interest coverage ratio on profitability of selected distribution utilities in India

The Table 6.4 shows a positive coefficient, indicating a decrease of one unit in interest coverage ratio will decrease profitability by 11.12 units. The findings suggest a significant impact of interest coverage ratio on the profitability of the sample utilities at 5% level of significance. Therefore the research hypothesis is accepted.

Table No. 6.4: Regression Estimates of ROCE
(Random Effect Model)

Variable	Coefficient	Std Error	t-statistic	Prob.
C	1.137491	5.382297	0.211339	0.8330
DQR	20.12276	19.92078	1.010139	0.3146
DALR	11.40175	25.38132	0.449218	0.6542
DDTR	5.071254	2.999332	1.690795	0.0937
DCTR	-0.097272	2.294254	-0.042398	0.9663
DCE	2.068072	0.834208	2.479086	0.0147
DICR	11.12788	2.233134	4.983078	0.0000

a. ROCE dependent variable

Table No. 6.5: Model summary
(Panel EGLS (Cross-section random effects)

R-squared	Adjusted R-squared	S.E. of regression	F-statistic	Prob. (F-statistic)	Durbin-Watson stat
0.321057	0.284024	53.14040	8.669	0.0000	1.9679

b. Dependent Variable: DROCE
c. Predictors : constant variable: net current assets, quick ratio, absolute liquid ratio, debtors turnover ratio, creditors turnover ratio, collection efficiency, debt equity ratio and interest coverage ratio

H_7: There is a significant impact of working capital on the profitability of sample utilities in India.

The Table 6.5 shows the model summary of panel EGLS (Cross – section random effects). The R-Squared is 0.32 and adjusted R-Squared is 0.28, indicating that 28.40% of variables have been explained by independent variables in this specific model. The F-statistic is used to test the overall significance of the model. The Durbin–Watson test statistic is used to detect the presence of autocorrelation in this model. If the value of the test statistic is closer to 2, it means that the model has no autocorrelation. The statistic test value of 1.96 indicating that the specific model is free from autocorrelation. The joint effect of all coefficient is significant (F=8.66 at P=0.00) which means that overall working capital management variables do impact the profitability of these utilities. The

model is fit. Therefore the research hypothesis is significant at 5% level and therefore it is accepted.

6.9 Summary of Hypotheses Tested

The summary of hypotheses tested for understanding the relationship between the dependent variables and independent variables is shown in Table 6.6.

Table No. 6.6: Summary of Hypotheses

Hypotheses	Significance Level	Alternate Hypotheses (H1)
Quick Ratio	5%	Rejected
Absolute Liquidity Ratio	5%	Rejected
Debtors Turnover Ratio	5%	Rejected
Creditors Turnover Ratio	5%	Rejected
Collection Efficiency	5%	Accepted
Interest-Coverage Ratio	5%	Accepted

The collection efficiency and interest coverage ratio are significant at 5% level of significance. Therefore there is a significant impact of collection efficiency and interest coverage ratio on the return on capital employed of the sample utilities. Hence the research hypothesis is accepted. Further, is found to be insignificant at 5% level of significance.

The other variables such as quick ratio, absolute cash ratio, debtor's turnover ratio and creditor's turnover ratio are found to be insignificant at 5% levels of significance. The research shows that debtors turnover is an important variable in this industry, hence the hypothesis cab be accepted at 10% level of significance.

CHAPTER – VII
WORKING CAPITAL, FINANCING AND CASH MANAGEMENT OF SELECT POWER DISTRIBUTION UTILITIES

7.1 Introduction

The working capital management of firms is very important in determining the level of working capital available, which in turn influences performance (Tauringana and Afrifa, 2013). The efficient management of working capital is always a concern for the smooth running of the enterprises. In case the management is inefficient in managing working capital, it will lead to interruption in cash flows and notched supply and procurement of raw material, irregularity in payments of wage and salaries and ultimate leading to virtual stoppage of operations of the businesses (Rathod, 2008).

A proper management of working capital is required to deal with working capital policies, working capital financing, management of optimal cash etc. The managers should eliminate obstruction in the procurement of working capital financing. Furthermore, continuous flow of working capital finance is viable for impressionable management of utilities.

Working capital management has to maintain a tradeoff between liquidity and profitability. To accomplish these objectives, proper management of cash is important. The level of cash should neither be excess nor inadequate. In either case, the utility will harm the operations of the business. However, cash balance must be adequately maintained to meet future obligations and avoid large cash reserves. In case the utility has excess cash reserves, it should invest in short-term securities. Therefore reducing opportunity and carrying cost for the idle funds lying in the form of cash.

The working capital management and practices of each company / utilities are unique. According to Al-Shubiri (2010), it is found that there is difference between industries in the management of working capital practices. Moreover, these working capital practices, themselves, change significantly within industries over time According to Jingmeng (2013), a management system for efficient management practices has not been constructed, although working capital management has been widely accepted by the

academia. Hence working capital management should be effectively and efficiently followed. The management should make appropriate working capital policies to improve optimization of current assets and minimize the wastage of funds.

Therefore a questionnaire was used to enquire into the working capital policy, financing of working capital and the cash management practices from the general managers of select sample utilities.

7.2 View on Conscious Working Capital Policy

The Table 7.1 shows responses related to conscious working capital policy. About 81.8% of the respondents believe in conscious working capital policy which means most of the utilities have a conscious working capital policy as it is important in making day to day work easier. The utilities which do not follow conscious working capital policy amounted to 13.6% while 4.6% of them did not know whether the utility is having a policy or not.

Table No: 7.1: View on Conscious Working Capital Policy

	Percent
Yes	81.8
No	13.7
Don't Know	4.5
Total	100.0

7.3 View on Conscious Receivable policy

The Table 7.2 shows the respondents view on whether the management believes in conscious receivables policy or not. Most of the respondents (81.8%) said that they believe in a conscious receivable policy while 13.7% disagreed and only 4.5% of respondent said they do not know.

Table No. 7.2: View on Conscious Receivables Policy

	Percent
Yes	81.8
No	13.7
Don't Know	4.5
Total	100.0

7.4 Views on Conscious Cash Management Policy

The Table.7.3 below shows whether the utilities have a conscious cash management policy. All the respondents believed that utilities have a conscious cash management policy. This means that without it the utilities cannot manage the work properly.

Table No: 7.3: View on Conscious Cash Management Policy

	Percent
Yes	100.0
No	0.0
Don't Know	0.0
Total	100.0

7.5 Connection between Working Capital Policy, Receivables, Cash Management and Profitability

The respondents were asked whether there is any relationship between working capital policy, receivables management and cash management on the profitability of the power distribution utilities. The views of the respondents have been discussed in the next paragraph.

7.5.1 Connection between Working Capital Policy and Profitability

The Table 7.4 shows the view of respondents whether there exists relationship between the working capital policy and profitability of the utility. Most of the respondents (77.3%) agreed, while 22.7% disagreed with the given statement. It shows that most of the utilities have agreed that there is a connection between working capital policy and profitability.

Table No.7.4: Connection between Working Capital Policy and Profitability

	Percent
Yes	77.3
No	22.7
Don't Know	0.0
Total	100.0

7.5.2 Connection between Receivables Management and Profitability

The connection between receivables management and profitability is presented in Table 7.5. The majority of the respondents i.e., 95.4% stated that there exists relationship while 4.6% affirmed that there is no relationship between the receivables management and profitability of the utilities. Surely there is a relationship between receivables management and profitability of power distribution utilities because debtor's management plays a vital role in the performance of utilities.

Table No.7.5: Connection between Receivables Management and Profitability

	Percent
Yes	95.4
No	4.6
Total	100.0

7.5.3 Connection between Cash Management and Profitability

The view of respondents whether there exists a connection between the cash management and profitability of the utilities is presented in Table 7.6. Three-fourth of respondents believed that there exists a relationship, whereas one-fourth of them said that there is no relationship between the cash management and profitability.

Table No. 7.6: Connection between Cash Management and Profitability

	Percent
Yes	77.3
No	22.7
Total	100.0

7.6 Nature of Working Capital Policy

Working capital management policy implies comprehensive consideration of risk and cost (Jingmeng, 2013). When asked how does the utility manage working capital policy, 27.2% respondents expressed that they manage by formal written policy, 36.4% said that it is both formally and informally managed, whereas 18.2% said they have an informally managed policy. 18.2% affirmed that they manage working capital policy by their experience. It can be inferred that working capital policy is mostly managed through both formal and informal methods and manager's experience in the utility.

Table No. 7.7: Nature of Working Capital Policy

	Percent
Formal Written	27.2
Both Formal and Informal	36.4
Informal	18.2
Managed By Experience	18.2
Total	100.0

7.7 Responsibility for Formulation of Working Capital Policy

The working capital policy will be formulated and decided by top level and upper and middle-level management at the corporate office. Most of the respondents said that Chief General Manager/Financial officers, Senior Executive Managers of Finance and accounts section, Financial Advisor with subsequent consultation and approval by Board of Directors formulate working capital policies. Further, state regulatory commission of respective state plays a vital role in the formulation of policy. While formulating working capital policy, financial managers or head of finance department work out for the optimal level of working capital in order to avoid the dangers of inadequate or excessive working capital. Moreover, the management also considers the aspect of profitability and solvency to optimize working capital policy.

7.8 Type of Working Capital Policy

There are three types of working capital policies followed by any firm. These are aggressive, conservative and moderate working capital policy. The conservative policy implies greater liquidity and lower risk and return, and an aggressive policy indicates poor liquidity and higher risk and return. Hence optimum level (matching policy) of working capital is better to avoid inadequate or excessive working capital.

Table No.7.8: Type of Working Capital Policy

	Percent
Cautious (Risk avoiding)	22.7
Aggressive (Risk Accepting)	9.1
Situational	68.2
Total	100.0

The question is aimed to know the type of working capital policy followed by the utilities. The Table 7.8 presents the views of respondent's on working capital policy adopted by the utilities. About 22.7% of respondents opt for cautious policy while 9.1% have an aggressive policy. A majority of respondents i.e., 68.2% have agreed that they

follow situational policy. The policy can be changed according to the circumstance of the utilities. The companies which adopt situational policy are more flexible in managing working capital components are more adaptable to changes in the environment (Darun, 2011).

7.9 Frequency of Reviewing Working Capital Policy

The Table 7.9 shows how frequently working capital policy is reviewed by the utilities. With respect to the frequency of policy review, 9.1% of respondents said they review working capital policy on monthly basis and 9.1% review on annual basis. 81.8% of the respondents in the survey indicated that their policy is reviewed whenever necessary, rather than on a regular basis.

Table No. 7.9: Frequency of Reviewing Working Capital Policy

	Percent
Monthly	9.1
Annually	9.1
Whenever necessary	81.8
Total	100.0

7.10 If the Working Capital Policy is formulated by Finance Person, will you appreciate the Integrity of Working Capital Policy?

The Table 7.10 presents the opinion of respondents whether they appreciate if the policy is formulated by finance managers. The majority of respondents i.e., 81.8 viewed that they would appreciate if the working capital policy is formulated by finance managers while 18.2 said that they do not appreciate the same.

Table No.7.10: If Working Capital Policy is formulated by Finance Person, will you appreciate the Integrity of the Policy

	Percent
Yes	81.8
No	18.2
Total	100.0

7.11 Internal Assessment for Evaluating the Efficiency of Working Capital Policy

The respondent's view on whether the utility follows an internal assessment for evaluating the working capital policy is shown in the Table 7.11. About 45.4% of respondents agreed that they have an internal assessment mechanism while 45.4% said they do not have any internal assessment for evaluating the working capital policy. 9.2% of respondents did not provide any opinion.

Table No.7.11: Internal Assessment for Evaluating the Efficiency of Working Capital Policy

	Percent
Yes	45.4
No	45.4
Don't Know	9.2
Total	100.0

7.12 Evaluation of Working Capital Policy

The evaluation of working capital policy efficiency can be determined by indicators such as improvement of billing resulting in a higher turnover, improvement in collection of revenue, reduction of transmission and distribution losses, and increase in the consumer base. The upper and middle-level managers in finance and accounting department can use these indicators to judge the efficiency of working capital policy.

7.13 Inputs from the Field Staff for Formulation of Working Capital Policy

The Table 7.12 shows whether the utilities consider inputs from the field staff for the formulation of working capital policy. One-fourth of the respondents said that they consider opinions and suggestions from the lower level management i.e. field staff. Only 27.3% said they consider inputs from the field staff while formulating working capital policy. The management should consider the inputs and suggestions of field staff in policy making decisions. The lower level management and the field officers should be taken into confidence before preparing working capital policy.

Table No.7.12: Does the Utility Consider Inputs from the Field Employees for Formulation of Policy

	Percent
Yes	27.3
No	63.6
Don't Know	9.1
Total	100.0

7.14 Sharing of Working Capital Policy with Field Employees

The Table 7.13 enquires whether the utility shares working capital policy with its field staff. About 27.3% of the respondent viewed that the utilities share information related to working capital policy whereas a majority of respondents i.e. 68.2% said that they the utilities do not share such information with its employees. The field staffs are the employees who are in direct contact with the consumers. They have relevant information, which may be helpful in formulation and implementation of policy. Generally, in power distribution utilities, the management doesn't share the working capital policy decision with lower level employees.

Table No7.13: Does the Utility Share Working Capital Policy with Field Employees?

	Percent
Yes	27.3
No	68.2
Don't Know	4.5
Total	100.0

7.15 Sharing of Working Capital Policy in the Form

The view of respondents in what ways does the utility share its working capital policy with its employees is presented in the Table 7.14. It shows that 7.2% of respondents said they share in the form of vision, 21.4% share in the form of survival mission, whereas 21.4% share in the form of service motto. A greater share of the respondent with 50% said they share the policy in the form of target to its employees.

Table No. 7.14: If the Working Capital Policy is Shared in the Form

	Percent
Form of Vision	7.2
Form of Target	50.0
Form of Survival Mission	21.4
Form of Service motto	21.4
Total	100.0

7.16 Factors Influencing Working Capital Management

Working capital management is influenced by a number of factors. The operational scope of WCM is broader, and involves consideration of multiple internal and external factors; consequently little is known about WCM practices in complex organizational settings (Darun, 2011). Both internal, as well as external factors, have an

influence on the volume of working capital required by a utility. The nature of the business or industry influences working capital requirement of a firm. These specific factors which are unique to each Industry will help in deciding the level of working capital requirements of the firm / utility. Service firms like power distribution utilities which run to cater to the needs of the public, requires less working capital. But in the case of heavy manufacturing industries, the operating cycle is quite longer, blocking most of the funds in stock and debtors, and therefore the requirement are proportionately high.

7.16.1 Political Intervention

The Table 7.15 shows whether political intervention or influence is an important factor in determining working capital requirements. 31.9% of the respondents agree while a majority of them i.e., 63.6% disagree that political Intervention/influence is a determinant of working capital management. Only 4.5% said that they neither agree nor disagree. Though political intervention or influence is an important determinant of working capital needs, respondents were hesitant to put it on paper.

7.16.2 Industry effect

Hawawini, Viallet, and Vora (1986) stated that there is a substantial industry effect on firm working capital management practices that are stable over time. Since different industry requires a different level of capital intensity depending on their business model, one would logically expect to find different working capital requirements. When asked about whether Industry effect is a determinant of working capital, 68.2% of them agreed, while 22.7% disagreed and 9.1% neither agree nor disagreed. It can be concluded that industry effect is a major factor in determining of working capital.

7.16.3 Business and Economic Environment

One of the major determinants of working capital is business and economic environment as 100% of the respondents agreed to the statement.

7.16.4 Government Rules and Regulations

The Table 7.15 shows the influence of government rules and regulations in determining working capital**.** About 86.4% of the respondents agree, 4.5% neither agree nor disagree and 9.1% disagree with the statement whether government rules and regulations is a factor in determining working capital.

Table No.7.15: Factors Influencing Working Capital Management

	Agree	Neither Agree or Disagree	Disagree
Political Intervention	31.9	4.5	63.6
Industrial Effect	68.2	9.1	22.7
Business & Economic Environment	100.0	0.0	0.0
Government rules and regulations	86.4	4.5	9.1
Consumer requirements	63.6	4.5	31.9
Financing methods	54.6	40.9	4.5
Technology usage	72.7	4.5	22.7
Collaborations with suppliers	54.6	22.7	22.7
Competitors Effect	31.9	5.4	22.7
Management system/method	77.3	18.2	4.5
Organizational behavior	50.0	45.5	4.5
Investment Policy	45.5	36.3	18.2
Supply chain Management	63.6	27.3	9.1
Inventory Management policy	95.4	4.5	0.0
Employees Finance Knowledge	22.7	50.0	27.3
Credit Policy	100.0	0.0	0.0
Payable Policy	95.5	4.5	0.0

7.16.5 Consumer Requirements

The Table 7.15 shows the influence of consumer requirements in determining working capital. About 63.6% of them agree while 4.5% neither agree nor disagree and 31.9% of them disagree with the statement.

7.16.6 Financing Methods

When asked to respondents, whether financing methods is a determinant's of working capital management. About 54.6% of them agreed while 4.5% disagreed and 40.9% neither agreed nor disagreed with the statement. This shows that financial methods have a positive impact on determining working capital management.

7.16.7 Technology Usage

One of the key factors that determine working capital requirements is technology, as in this day and age, modern technology is preferred to older methods of techniques in any sector. When asked about it most of the respondents i.e., 72.7% of them agreed, while 4.5% of them neither agree nor disagree and about 22.7% of them disagree with the statement.

7.16.8 Collaboration with Suppliers

Collaborations with other companies and with different divisions of that sector will enhance and improve the functioning of the business. Collaborations with suppliers are important as delays will have an impact on production and supply of the product or service. About 54.6% of the respondents agreed that collaborations with suppliers have an effect on the working capital while 22.7% disagreed and 22.7% neither agreed nor disagreed.

7.16.9 Competitor's Effect

The power sector is one of the major parts in building infrastructure for the development of the nation. The large scale government utilities enjoy monopoly; therefore mostly competition does not exist. Among the sample respondents, 45.4% of them felt that competitor's effect is a determinant or not, while 31.9% and 22.7% of them agreed and disagreed respectively.

7.16.10 Management System

Management system plays a key role in policy making for all the section of the utilities. It is the framework of policies, processes and procedures used by an organization to ensure that it can accomplish all the tasks required to meet its objectives.

The Table 7.15 shows whether management system determines the working capital requirement. Among the sample respondents, 77.3% of them agreed while 18.2% neither agreed nor disagreed and the remaining 4.5% of them disagreed with the statement.

7.16.11 Organizational Behavior

When asked whether the organizational behavior is one of the factors in determining the working capital, about 50% of them agreed while 4.5% disagreed and 45.5% neither agreed nor disagreed.

7.16.12 Investment Policy

The Table 7.15 shows respondent's view on whether investment policy is a factor of working capital. About 45.4% of respondents agreed, 36.3% of them neither disagreed nor agreed and 18.2% disagreed with the statement that investment policy is an important determinant of working capital management.

7.16.13 Supply Chain Management

The Table 7.15 shows supply chain management in determining the working capital. About 63.6% of the respondents agree, 27.3% of neither agree or disagree and 9.1% disagree with the statement.

7.16.14 Inventory Management

Idle Inventory is a cost to the utility. In utilities, inventories are not stock which is sold to the end consumer, but they are spares, fittings etc. which are used for

installation or maintenance. Therefore the level of inventory does not have any relationship with sales in this specific sector.

The Table 7.15 shows that 95.5% of the respondents agreed that inventory is a determinant of working capital management whereas 4.5% neither agreed nor disagreed. The power distribution utilities are not influenced by seasonal variation. The utilities maintaining a high proportion of inventory will lead to block of funds, hence increasing the carrying cost of utility.

7.16.15 Employee's Financial Knowledge

The Table 7.15 shows that financial knowledge has very little to do with the factors determining the working capital of the utility. 22.7% of respondents agreed, while 50% neither agreed nor disagreed and 27.3% disagreed with the statement that employee's financial knowledge is important determinant of working capital.

7.16.16 Credit Policy

The credit policy of a firm largely depends upon industry norms and firm-specific policies in issuing credit to customers. The credit policy will have a direct effect on the size of the debtors. In case if the firm follows a nominal credit policy, it protects the firm from bad debts and decreases the requirement of working capital. The Table 7.15 shows the view of respondents on whether credit policy influences working capital management. All the respondents agreed that credit policy of the utility is an important factor in determining working capital management. Credit policy is a major factor in determining working capital requirements as 100% of the respondents agree to the statement.

7.16.17 Payable Policy

The utility which receives credit from creditors for the purchase of raw material requires less working capital and vice-versa. Generally, the utilities delay their payments to generation and transmission utilities. Most of the times, the utilities have a higher payable period when compared to debtor's period.

The Table 7.15 shows whether there is influence of payable policy on working capital. A majority (95.5%) of the respondents agreed that payable policy of utilities has an influence in managing working capital whereas 4.5% of them neither agreed nor disagreed.

7.17 Working Capital Financing

Working capital financing is a key need and challenge for every firm. It is concerned how a firm finances its current assets. In a broader sense, it is company's overall non-fixed asset investments. The growth of company requires a lot of cash in the day to day operations of the business. To ensure that a firm is able to continue its operations uninterruptedly, it has maintained sufficient funds to fulfill the short term requirement of the firm.

7.18. Working Capital Finance Approach

Working capital financing determines the ratio of short-term financing to long-term financing. There are three approaches which the firm uses in mixing the sources of finance. The Table 7.16 shows the working capital financing approaches followed by the power distribution utilities.

7.18.1 Matching Approach / Moderate Approach

Among the sample respondents, 40.9% affirmed that their utilities are adopting matching approach. The utility plays safe by adopting this approach. They use long–term funds to finance fixed assets and permanent current assets whereas temporary assets are financed by short–term sources of finance.

7.18.2 Conservative Approach

About more than half of the respondents viewed that they follow a conservative approach for financing working capital. Under this approach, the utility uses its long-term funds to finance permanent current assets and also a part of temporary current assets. The remaining temporary assets are financed by short-term finance. They

mainly rely on long-term sources of finance as a part of working capital investment strategy.

Table No. 7.16: Working Capital Financing Approach

	Percent
Matching Approach	40.9
Conservative Approach	54.6
Aggressive Approach	4.5
Total	100.0

7.18.3 Aggressive Approach

A small proportion of respondents i.e. 4.5% said that they follow aggressive approach for financing working capital policy. These utilities rely more on short-term financing than the justified level. This approach is riskier but the chances of earnings high-returns are high. It can be inferred that the utilities do not have adequate short-term funds to manage their short-term obligations

7.19 Forms of Working Capital Financing

Working capital can be financed through long-term funds, short-term external sources and internal sources. Most of the businesses finance their working capital through commercial banks by mortgaging inventories and/or debtors. According to Garg (1999) "state enterprises also get loan from the government or state financial corporations to meet the working capital requirements", but in contrary the finance ministry has asked banks to stop providing working capital finance to utilities that have huge losses and said that it is critical to determine end-use of the funds. Therefore there exists a problem in procuring finance for state-run enterprises.

There are different forms of working capital financing available in the market. The utilities can procure finance through bank loans, credit from suppliers, commercial papers, public deposits, inter-corporate deposits, security deposit from

consumers and income received in advance from consumers and others. The Table 7.17 shows the type of working capital financing used by sample utilities.

7.19.1 Bank Loan

Banks provides loans to finance working capital requirements to meet their operating expenses. About 95.5% of respondents agreed that bank loan is an important source of working capital financing whereas 4.5% of respondents said that it is not a source of financing.

7.19.2 Trade Credit

In every business activity, there is a seller and a purchaser. When the supplier grants credit to the purchaser during the normal course of business, the credit given is called as trade credit. It is a spontaneous source of financing because it arises from the ordinary business transaction (Brigham and Houstan, 2015). The supplier decides the trade credit terms and conditions according to their business needs. About half of the respondents agreed that trade credit is used as a source of working capital finance whereas, 22.7% neither agreed nor disagreed and the rest of the respondents disagreed.

7.19.3 Commercial Paper

Commercial paper is an unsecured promissory note. The cost of commercial paper is cheaper as compared to bank loans but they are used by blue chip /large firm which has a high credit rating in the business market. It is issued at a discount on the face value.

The Table 7.17 shows the view of respondents on commercial papers as a source of short-term finance. Almost all the respondents (95.5%) disagreed that commercial papers are a good source of short-term finance for power distribution utilities, while 4.5% agreed that commercial papers are good for financing short-term funds.

Table No.7.17: Type of Working Capital Financing

	Agree	Neither Agree or Disagree	Disagree
Bank Loan	95.5	0.0	4.5
Trade Credit	50.0	22.7	27.3
Commercial Paper	0.0	4.5	95.5
Inter Corporate Deposits	18.2	4.5	77.3
Security Deposit from Consumers	22.7	27.3	50.0
Income received in advance	18.2	4.5	77.3

7.19.4 Inter Corporate Deposits

Inter corporate deposits are unsecured and sensitive in nature. They are deposits made by one company with another company, and usually, carry a term period of six months. The three types of inter-corporate deposits are namely three-month deposits, six-month deposits, and call deposits. Among the three, call deposits are mostly preferred. Only 18.2% of respondents agreed whereas 77.3 % disagreed that the utilities use inter-corporate deposits to finance working capital. Due to the unsecured and sensitive nature, they are not much preferred.

7.19.5 Security Deposit from Consumers

Any person entering into an agreement with the power distribution utility for supply of power have to deposit an amount to cover charges (i.e. demand/fixed charges and energy charges as applicable) for supply of three months whereby-monthly bill is in vogue and two month charges in the case of monthly billing cycle, for the relevant consumer category. The security deposits are reviewed every year based on the average consumption of electricity during the period of April to March of every year.

Among the sample respondents, 22.7% said it is a source of short-term finance whereas 50.0% did not view that security deposit from consumer is a source to finance working capital. 27.3% of the respondents neither agreed nor disagreed.

7.19.6 Income Received in Advance

It is the amount of advance paid by the consumers before the usage of any service from the utility. In the case of prepaid metering, the utilities receive income in advance. The firm receives cash as a part of advance, which is the most liquid asset. The liability of the consumer will be delivered by providing service in future. Sometimes the consumers pay more than what they consume and the entire amount is marked in income received in advance.

Nearly 18.2% of respondents said that utility uses income received in advance from the consumer as a source of working capital financing whereas 77.3% of them did not agreed with the statement. It is a source of finance for working capital because it is free from interest charge to the utility. Only 4.5 of respondents did not have an opinion on the given statement.

7.20 Collateral Security for Obtaining Working Capital Finance

Collateral Security is a form of secondary protection or guarantee usually required by a bank and planned to guarantee a borrower's repayment on a liability obligation. The borrower offers property or other assets to the lender for securing a loan. On the other hand, the Lender will reduce the risk on nonpayment of loan installment by the consumer by securing loan.

The Table 7.18 shows whether the utilities provide collateral security for obtaining working capital finance. A majority of respondents (72.8%) said that the utilities provide collateral security while obtaining working capital finance, whereas, 27.3% of the respondents said ‘don’t know’.

Table No.7.18: Collateral Security for Obtaining Working Capital Finance

	Percent
Yes	72.8
No	0.0
Don’t know	27.3
Total	100.0

7.21 Type of Collateral Security Provided for Granting Finance

The utility usually provides collateral security to bankers as assurance for repayment of loan granted. In case it does not repay, the collateral security helps in collecting a proportion of loan amount due and hence reducing the risk of nonpayment from the lender.

7.21.1 Government Guarantee

Whenever a banker provides loan, a collateral security is required. Therefore government guarantee is a form of collateral security used to obtain loan from a banker. The government by providing guarantee will purchase the debt from the lending financial institution and take on responsibility for the loan. In case of non-payment of loan amount by power distribution utilities, the liability lies with the government. The State Government provides guarantee for short-term financing of working capital. The majority of loans are granted after providing government guarantee as collateral security.

7.21.2 Hypothecation of Assets

It is the practice where (usually through a letter of hypothecation) a borrower (utility) pledges collateral to secure a short-term debt or a borrower, as a condition precedent to a loan, or as third party (usually an affiliate) pledge collateral for the borrower. The utility obtains working capital from banks after providing collateral security as hypothecation of receivables and inventories. Most of the times either or both inventories and receivables are hypothecated to raise loans from financing institution as security against the bank loan extended by them as the case may be.

7.22 Difficulty in Procuring Working Capital Finance

The nature of business requires utilities to adjust their strategies and adopt good financial policies to survive and sustain growth. These utilities often face difficulties in raising short term finance. Easy accessibility of finance is an important

factor in deciding the source of finance, but its impact on risks and return cannot be ignored (Gitman, 2000).

The respondents view on problems faced by utilities in procuring working capital financing is shown in Table 7.19. A sample of 22.8% of respondents said they always have problems in procuring working capital while 4.5% of respondents said they face problems sometimes. 4.9 % said that they rarely face any problems whereas 31.8% said they never face problems in procuring working capital.

Table No.7.19: Difficulty in Procuring Working Capital Finance

	Percent
Always	22.8
Sometimes	4.5
Rarely	31.8
Never	40.9
Total	100.0

7.23 Type of Financial Institutions opted to Finance Working Capital

Working capital finance can be procured from different agencies or institutions. The respondents were asked to give their view whether the agencies such as a government, public sector banks, state financial corporation and suppliers are important in procuring working capital. The Table 7.20 shows the type of financial institutions opted to finance working capital by sample utilities.

7.23.1 Government

A government is a system by which a state or nation is governed. It is a group of people with the authority to govern and control a nation or state. Therefore the state enterprises or utilities are governed and control by government.

Among the respondents, 50.0% opted for the government to finance working capital requirements of the utilities while 27.3% did not. Only 13.5% said that

they rarely opt government to finance working capital and 9.1% said that it is not at all useful source for procuring working capital.

7.23.2 Public Sector Banks

Public sector banks are banks where a majority stake (i.e. more than 50%) is contributed by a government. There is a total of 27 PSBs in India. A sample of 68.2% agreed that public sector banks are helpful in procuring working capital whereas 27.3% of them said it is somewhat useful and 4.5% affirmed that it is not very useful in procuring finance from public sector banks.

Table No.7.20: Type of Financial Institutions opted to Finance Working Capital

	Very useful	Somewhat useful	Not very useful	Not at all useful
Government	50.0	27.3	13.6	9.1
Public Sector Banks	68.2	27.3	4.5	0.0
State Financial Corporation	4.5	22.7	22.7	50.0
Suppliers	0.0	9.1	4.5	86.4

7.23.3 State Financial Corporation

Among the sample respondents, only 4.5% agreed that it is very useful source of working capital finance while the rest viewed it either somewhat useful or not at all useful as a source of financing agency. Hence it can be inferred that it is not very useful for utilities to procure short-term finance.

7.23.4 Suppliers

The extending payment periods and increasing credit limits with major suppliers is a fast and cost-effective way to finance working capital needs of the utilities. A majority of respondents i.e. 86.4 agreed that suppliers are not at all opted to finance working capital management whereas 9.1% said that they are somewhat useful and only 4.5% viewed it a not very useful.

7.24 Factors Hindering procurement of Working Capital Finance

The Table 7.21 shows the difficulties faced by sample utilities in processing working capital. There are several difficulties in procuring working capital finance. Hence this section illustrates the difficulty faced by power distribution utilities.

7.24.1 High Interest Rates

The high-interest rate charged by the financing institution constraints the power distribution utilities for procuring working capital from financing institutions. The Table 7.21 explains the respondent views of the respective utilities.

A majority (54.6%) of sample respondents agreed that high-interest rates prevailing in the market are a major factor in procuring working capital while 22.7% each have either disagreed or could not provide a conclusive opinion.

Table No.7.21: Factors Hindering Procurement of Working Capital Finance

Reasons	Agree	Neither Agree or Disagree	Disagree
High Interest Rates Prevailing In The Market	54.6	22.7	22.7
Unattractive Terms And Conditions Of Financing Institution	18.2	40.9	40.9
Low Creditworthiness Of The Utility	45.4	0.0	54.6
Restriction By Banking Institutions	40.69	18.2	40.9
Weak Financial Performance / Record By Your Firm	40.9	0.0	59.1
Lack Of Viable Alternatives To Bank Debt For Power Distribution Utilities	40.9	0.0	59.1

7.24.2 Unattractive Terms and Conditions of Financing Institution

The Table 7.21 shows whether unattractive terms and conditions laid by the financing institutions lay hurdles in procuring working capital. 18.2% said that unattractive terms and conditions of financing institutions expected to be the potential

hurdle in procuring working capital finance while 40.91% each of respondents either disagreed or could not provide a view on the given statement.

7.24.3 Low Creditworthiness of the Utility

The bankers do not finance to utilities whose creditworthiness is poor. These utilities find difficulty in procuring working capital finance due to the low repayment capacity. The Table 7.21 shows whether low credit worth of utility will lead to difficulty in processing workers capital finance. Among the sample respondents, 45.4% agreed while 54.6% of respondents disagreed that low credit worthiness of utility is a problem in processing working capital finance.

7.24.4 Restriction by Banking Institutions

The poor financial condition of the State power distributions has become increasingly difficult to serve their debts. Therefore the banking sector and financial lenders became very cautious in extending loans to the power sector as a whole. Even the Ministry of Finance notified the banks to stop providing working capital finance to utilities that have huge losses.

Among the sample respondents, 40.9% agreed and 40.9% disagreed that restrictions by financial regulators is a problem in procuring working capital finance while 18.2% of respondents have not come to any conclusion.

7.24.5 Weak Financial Performance / Record by Your Firm

The high losses thrust the financial health of state power distribution utilities into a distressed state. The Table 7.21 shows whether consistent weak financial performance is a constraint in procuring working capital finance. Nearly 40.9% of respondents agreed while 59.1% of sample respondents disagreed that weak financial performance is a problem in processing working capital finance.

7.24.6 Lack of Viable Alternatives to Bank Debt

The lack of viable alternative to bank debt for the power distribution utilities can be a problem in procuring working capital. The utility usually finds it difficult to procure working capital finance from another alternate source of finances.

The Table 7.21 shows whether lack of an alternative to bank debt is a problem in procuring working capital finance. Among the sample respondents, 40.9% agreed that it is a problem while 51.9% disagreed that they have an alternative to bank debt for financing working capital.

7.25 Cash Management

Cash is the most liquid assets for a firm, as it is in its original form. Cash can be in the form of cash in hand, cash in bank and or investment in short-term securities. So cash means not only cash but near cash assets. According to Banerjee (1997), cash management is "the amount of money a company's keeps with a bank on current deposits account (short-term) and the money it holds in the company's cash department." Further, Kapur (1999), defined cash management as "cash equivalent or marketable securities are referred to as highly liquid investments that are readily convertible into a known amount of cash and that were within three months of maturity when acquired."

Managing cash/fund is an important aspect of any entity irrespective of the business it is involved. Therefore cash is required by every organization and varies from one organization to another. It is required to make payments to employee, creditors, petty cash expenses in office and to handle cash inflows from a different class of debtors of the organization.

Cash should be managed efficiently and effectively. To be effective, cash management requires a regular process of monitoring the expected payments and receipts, and the forecasts need to be continuously updated to reflect the latest revenue and expenditure data (The World Bank, 2001). Managing cash is a tough task. Inefficient cash management can lead to losses on the path of the firm. The financial managers

should be vigilant, and avoid any errors and maintain an optimal level of cash in the account. There is no definition of optimal level of cash, as the required level of cash changes according to the needs of the firm. So cash management is a continuous task. There is no harm in maintaining adequate cash but the problems arise when the cash level are inadequate or in excess cash levels. Therefore the question arises to what should be done when the cash balance are inadequate or excess in a firm cash account? Further, cash is a non-operating asset, so there is always a lost opportunity for the cash available with the firm. Idle assets do not fetch any interest nor adds value by its own. The financial manager should use his instinct while handling cash. So whenever the firm has excess cash balances, it should be invested in marketable securities. These securities are short-term securities or deposits which have a maturity less than one year. It includes government securities, bank deposits, etc., which have a high demand in the market. The role of cash management is to eliminate idle cash, depositing collections and facilitating payments effectively.

7.26 Cash is Strategic Importance to Operations of the Utility

The Table 7.22 shows that all the respondents agreed that management of cash is of strategic importance to the utility. The respondents are aware that proper cash management will help in fulfilling the planned objective of the utility.

Table No.7.22: Does the Utility that Management of Cash is of Strategic Importance to the Operations?

	Percent
Yes	100.0
No	0.00
Don't know	0.00
Total	100.0

7.27 Maintain Optimal Cash Balances

The Table 7.23 describes whether the optimal cash balance is maintained by the utilities. To attain an optimal cash balance, utilities should have a tradeoff between trading cost. This will help the firms to reduce costs and boost profitability.

Table No.7.23: Does Your Company Maintain Optimal Cash Balances?

	Percent
Yes	81.8
No	18.2
Don't know	0.00
Total	100.0

When asked whether the firms maintain optimal cash balances, 81.8% of respondents said they maintain optimal cash balances while 18.2% do not maintain optimal cash balances.

7.28 Motive of Holding Cash

There is a cause for holding cash reserves in the firm. Every firm has a motive or need which makes the firm to maintain a certain level of cash. There are three reasons for holding cash in a firm. They are transaction motive, precautionary motive and speculative motive.

Table No.7.24: Motive behind Holding Cash Balance

	Percent
Transaction Motive	77.3
Precautionary Motive	18.2
Speculative Motive	4.5
Total	100.0

The utilities maintain cash with a transaction motive to buy or sell a good or service. Therefore cash is required to make payments relating to business transactions. In precautionary motive, the utilities maintain cash balance due to the uncertainty and demand of cash flows. The cash balance is required to bridge the gap between the inflows and outflows of cash which may rise due to uncertainty. The utility maintains cash with a speculative motive when the utilities' cash needs may arise due to the opportunities arising out of the future market conditions.

The Table 7.24 presents the motive behind holding cash balances by the sample utilities. Among the sample respondents, 77.3 percent of respondents said that business transaction was the motive for holding cash balances while 18.2 percent viewed that they hold cash balances due to precautionary motive. Only 4.5 percent of respondents felt they hold cash due to the speculations about future opportunities. Due to the nature of the service industry, most of the cash is held for transaction as no storage of inventory or sale takes place in this specific sector.

7.29 Preparation of Cash Budget

The Table 7.25 shows whether the utilities prepare cash budget or not. Among the sample respondents, 54.6% said they prepare cash budget while 40.9% said that they do not prepare at all. Only 4.5% viewed that they do not know whether they prepare cash budget or not.

Table No.7.25: Preparation of Cash Budget

	Percent
Yes	54.6
No	40.9
Don't know	4.5
Total	100.0

The following questions shown in Table numbers 5.26 to 5.29 are responded by managers who have agreed that they prepare cash budget. It enquires about the frequency

of cash budgeting and reporting and expected variances in payments and receipts of cash budgeting.

7.30 Frequency of Cash Budgeting

The Table 7.26 illustrates the frequency of cash budgeting. 16.7 % said that they manage to draw cash budget weekly, 68.3 % prepare monthly, and 8.3% prepare half-yearly and 16.7 % yearly. The utilities pressed with liquidity crunch may draw cash budget more often. This shows that the firms in question have more of short, very short run planning rather than more mature, annual cash budgeting.

Table No.7.26: Frequency of Cash Budgeting

	Percent
Weekly	16.7
Monthly	58.3
Quarterly	8.3
Annually	16.7
Total	100.0

7.31 Frequency of Cash Budget Reporting

The Table 7.27 illustrates the frequency of cash budget reporting. About 16.7% of respondents said they manage to draw cash budget reporting daily while 8.3% said weekly, 50.0 % reported monthly, and 8.3% reported quarterly and 16.7% reported yearly.

Table No. 7.27: Frequency of Cash Budgeting Reporting

	Percent
Daily	16.7
Weekly	8.3
Monthly	50.0
Quarterly	8.3
Annually	16.7
Total	100.0

7.32 Variance in Receipt side of Cash Budgeting

The Table 7.28 shows the respondents view on the preparation of cash budget. As per Table 5.25, only 54.6% of respondents prepare cash budget, among them only one –third said that the cash flows deviate from the expected cash flows whereas more than half of respondents said they have variances in receipt side sometimes. Only 8.3 % of respondents viewed that they prepare cash budgets accurately as they do not deviate much from the expected cash flows in the future.

Table No.7.28: Variance in Receipt side of Cash Budgeting

	Percent
Always	33.4
Sometimes	58.3
Rarely	8.3
Total	100.0

7.33 Variance in Payment Side of Cash Budgeting

The Table 7.29 shows the variance in payment side of the cash budgeting when compared in actual. As per Table 5.25, only 54.6% of respondents prepare cash budget, a small proportion i.e. 16.6 % agreed that there is always a variance, while 50.0 % of respondents

agreed that they have variance sometimes and only 33.4 % said that they prepare payments side of the cash budget accurately and have variances rarely.

Table No.7.29: Variance in Payment side of Cash Budgeting

	Percent
Always	16.6
Sometimes	50.0
Rarely	33.4
Total	100.0

7.34 Idle Cash Balances

The Table 7.30 shows whether the utilities have idle cash balances or not. It is found that 22.7% of the utilities always have idle cash balances while 68.2% affirmed that they never have idle cash balances. It can be inferred that the utilities have frequent cash flows problems.

Table No. 7.30: Idle Cash Balances

	Percent
Always	22.7
Usually	9.1
Never	68.2
Total	100.0

7.35 Investment of Excessive Cash Balances

The Table 7.31 shows whether the utilities make an investment with excess cash available. It was found that only one-fourth of utilities have idle cash (As cited in Table7.30). Among them only 21.4% said that they invest excess cash balances in short-term securities to gain interest on the excess cash and the rest of respondents viewed that they do not have excess cash balances, therefore do not invest in short-term securities.

Table No.7.31: Investment of Excess Idle Cash in Short-Term Securities

	Percent
Yes	21.4
No	71.4
Don't Know	7.2
Total	100.0

7.36 Strategy to Optimize Cash Management

There are different strategies to optimize cash management in utilities. The respondents were asked whether accelerating cash flows, delaying cash outflows until they come due, minimizing investment in inventory, borrowing cash at the best possible terms, investing surplus cash to earn a rate of return and maintaining an optimal level of cash that is neither excessive nor deficient will help in managing efficient cash management. The Table 7.32 shows the view of respondents whether these strategies help in optimizing cash management.

7.36.1 Accelerating Cash Inflows

Accelerating cash flows means speeding up collection of debtor's, income from other sources. The management should push its revenue management team to hasten collection process. The Table 7.32 shows whether acceleration or speeding up of cash inflows wherever possible will help in enhancing attainment of optimal cash management. All the respondents agree that speeding up of cash inflows acts as an effective strategy to optimize cash management.

7.36.2 Delaying Cash Outflows Until they Come Due

Respondents were asked whether delaying cash outflows until they come due will help to optimize cash management. The majority of respondents (81.8%) said that it is an effective way to optimize cash balances while 9.1% viewed that delaying cash outflows do not have any effect on cash management. Only 9.1% did not come to any conclusion.

Table No. 7.32: Strategy to Optimize Cash Management

	Effective	Neither Effective nor Ineffective	Ineffective	Total
Accelerating cash inflows	100.0	0.0	0.0	100.0
Delaying cash outflows until they come due.	81.8	9.1	9.1	100.0
Minimizing investment in inventory.	40.9	59.1	4.5	100.0
Borrowing cash at the best possible terms.	63.6	18.2	18.2	100.0
Investing surplus cash to earn a rate of return.	31.8	54.6	13.6	100.0
Maintaining an optimal level of cash that is neither excessive nor deficient.	72.7	27.3	0.0	100.0

7.36.3 Minimizing Investment in Inventory

Inventory does add value, if they are idle. High investment in inventory will not only block investment, but also increases the cost of holding inventory. The respondents were asked that lowering the amount of investment in Inventory will act as an effective strategy to optimize cash management. 40.9% said that it is effective while 59.1% stated that it is neither effective nor ineffective. Only 4.5% of respondents viewed that reducing investment in inventory does not have any effect on cash management.

7.36.4 Borrowing Cash at the Best Possible Terms

The utilities with adequate liquidity and creditworthiness can bargain at the best possible terms and the utilities with illiquidity cannot bargain while financing funds from institutions. The Table 7.32 shows whether borrowing cash at best possible terms will act as a strategy to optimize cash management. A majority of respondents (63.6%) agreed that it is an effective strategy in optimizing the cash management whereas 18.2% of respondents considered it as an ineffective strategy. Another 18.2% respondents could not come to a decision on whether this strategy is effective or not.

7.36.5 Investing Surplus Cash to Earn Returns

The utilities sometimes have excess cash than the required level of cash needed for managing operating expenses. In such case, the cash does not create any additional value; hence investment of such surplus cash will earn little interest creating a value addition.

Table 7.32 shows that 31.8% of respondents agree that investing surplus cash to earn a return on investment is an effective strategy to optimize cash management while 54.6% of respondents did not come to a conclusion. Only a small proportion (13.6%) of respondents felt that investing surplus cash will not be helpful in managing optimal cash management.

7.37 Conclusion

This chapter has focused on the working capital policy, financing of working capital and the cash management practices of sample firms. It is found that majority of respondents agree that there is a connection between working capital policy, receivables management, cash management and profitability respectively. Two-third of respondents adopt a situational working capital policy and review policy whenever necessary, rather than reviewing regularly.

Most of the utilities adopt matching or a conservative approach of working capital finance. Mainly banks do provide working capital finance to power distribution utilities. These utilities provide collateral security in the form of government guarantee and hypothecation of assets to obtain working capital finance. Factors such as high-interest rate and low creditworthiness of utility hinder in the procurement of finance.

Further, all the respondents agree that cash management is of strategic importance. Only one-third agreed that they have idle cash balances and further only a small proportion of respondents agreed that they do invest idle cash in short-term securities. Cash management can be optimized by accelerating cash inflows, followed by delaying cash outflows until they come due.

CHAPTER – VIII

MANAGEMENT OF RECIEVABLES IN POWER DISTRIBUTION UTILIITES

8.1 Introduction

Receivables management is an important element in the management of working capital. When a business sells a product or delivers a service to the consumers, they either sold it on cash basis or credit basis. If the product or service is sold on cash, the finished product will be transformed into cash, resulting in a time lag between the sale of product/service and realization of cash from consumers.

8.2 Consumers of Power Distribution Utilities

The consumer of power distribution utilities comprises of both commercial and non-commercials. They comprise of individuals, institutions and business organizations. The customers have been divided on the purpose and usage of electricity. The utility charges different prices for a different set of consumers based on the economic usage. The following are the classification of consumers based on usage. The low tension consumers are domestic, non-domestic, Industrial (Low Tension), cottage industries, agriculture, public bodies / local bodies, general purpose, and temporary users. High tension consumers are classified into industrial segregated category, industrial non-segregated category, irrigation and agriculture category, railway traction category, township and residential colonies category, RESCOS and temporary supply and revenue from sale of power to others (Discom to Discom, Interstate & UI Sales).

8.3 Debtors Management in Power Distribution Utilities

The Electricity utilities provide electricity to the consumers. The consumers can be domestic, industrial or government. At the beginning of every month a representative of the power distribution utility visits the consumer at the doorstep and checks the meter reading on the spot. Once the meter is checked, the consumption of electricity units is recorded by knowing the difference between the current month and

previous month reading. Once the meter reading is recorded; the bill is delivered to the consumer on the spot. There are many options for making payments for usage of electricity. Therefore, the consumer can make payment to the DISCOMs via online payments, spot payments, etc. To control credit, the utility has to control and monitor the defaulter consumers. The process of debtor's management in power distribution utilities can be shown in figure 8.1.

Figure No. 8.1: The process of Debtor Management consists of six steps.

8.4 Primary Goal of Debtors Management

The Table 8.1 shows the primary goal of debtor's management of sample power distribution utilities in India. A majority of respondents (45.50) indicated that the primary goal of debtor's management is to reduce the risk of utilities, while 22.7% of respondents stated to improve sales and 4.5% stated that to balance the usage rate and profit growth of utilities. Further 22.7 said some other reason could be the primary reason of the debtor's management.

Table No. 8.1: Primary Goal of Debtor's Management

	Percent
Risk Reduction	45.5
Profit Growth	4.5
Sales Growth	22.7
To Balance Usage Rate	4.5
Other Reasons	22.7
Total	100.0

8.5 Company Maintains Formal Record Keeping

Formal record keeping helps the utilities to have systemic and up-to-date information of all the categories of consumers. It will help in understanding how far the utilities have been successful in practicing formal record keeping.

The Table 8.2 indicates whether the utilities maintain formal records of the debtors in sample power distribution utilities or not. When asked, 77.3% of respondents said that they maintain a formal record keeping of debtors in their respective utilities while 13.6% said they do not maintain any record of the debtors. Only 9.1% said that they are not aware, whether the utilities are maintaining any records or not.

Table No.8.2: Company Maintains Formal Record Keeping

	Percent
Yes	77.3
No	13.6
Don't Know	9.1
Total	100.0

8.6 Reasons for Granting Credit to Consumers

There are several reasons for granting credit to the consumer. The Table 8.3 shows the credit criteria used by utilities for granting credit to consumers in power distribution utilities. 63.6% of respondents indicated that these utilities granted credit as a policy to provide service to public. Another 18.2% said it is provided as a support to public services by the government while 9.1% believed that it is provided with a commercial motive and 9.1% conjectured that there could be any other reason for granting credit to consumers.

Table No.8.3: Reasons for Granting Credit to Consumers

	Percent
As a policy to provide service to public	63.6
Support of Public services by government	18.2
Commercial Motive	9.1
Other	9.1
Total	100.0

8.7 Factoring Services

The Table 8.4 shows whether the utility use factoring services to collect pending debts. 31.8% of respondents said that the utilities use factoring services to collect pending debtors from doubtful debtors and bad debts while a majority (54.6%) said that the utility put efforts on its own to collect pending debts and they do not use any kind of factoring service. A small proportion (13.6%) indicated that they are not aware whether the utility uses any factoring services or not.

Table No. 8.4: Does your Utility Use Factoring Services?

	Percent
Yes	31.8
No	54.6
Don't Know	13.6
Total	100.0

8.8 Credit Insurance

The Table 8.5 indicates the usage of credit insurance by sample power distribution utilities. Among the sample respondents, a small proportion of respondents (4.5%) indicated that they use credit insurance to secure the nonpayment of dues from consumers, but a majority (81.9 %) said that they do not use such services. It can be inferred that the sample utilities do not depend on credit insurance service in India.

Table No. 8.5: Does your Utility Use Credit Insurance Services?

	Percent
Yes	4.5
No	81.9
Don't Know	13.6
Total	100.0

8.9 Structure for Managing Debtors Efficiently

The respondents said that they have a well-defined organizational structure for managing debtors efficiently. The lower level officer and field officers are controlled by divisional level officers, who are responsible for managing the revenue demand at each divisional office. The divisional level officers are managed by a circle superintendent engineer or an officer. He is responsible for managing weekly, monthly demand collections, expected arrears. The circle superintendent officers are controlled by a chief general manager from the corporate office. They are responsible for managing the circle wise, division wise and distribution wise collections of due amount and verify the arrears pending at each level. Further the directors, managing director, chief general manager, and the superintendent engineer share and discuss information or problems via telephone to ensure the efficiency of managing debtors.

8.10 Frequency of Meetings to Solve Debtor's Issues

Meetings are held to discuss certain issues related to a particular problem. The question deals with the frequency of meetings held to solve issues related to debtors. More frequent meetings indicate that the utilities are more concerned about the debtor issues such as nonpayment of dues from consumers and rise in bad debts. Hence, the utilities discuss and solve these issues to achieve greater efficiency.

Table No. 8.6: Frequency of Meetings to Solve Debtor's Issues

	Percent
Weekly	22.7
Monthly	54.5
Quarterly	22.7
Total	100.0

The Table 8.6 shows the frequency of meetings held to solve debtor's issues in power distribution utilities. 22.7% of respondents said that weekly meeting are held, while 54.5% said that they conduct monthly meetings to discuss and solve issues related to debtor's management in power distribution utilities. Another 22.7% carry out meetings quarterly. The utilities which conduct a weekly meeting are more concerned with the debtor's issues and make a deliberate attempt to discuss strategies and solve relevant issues pertaining to debtor's management.

8.11 Efficiency in Controlling Risk Related to Debtors

There is a certain risk in managing debtors. All the consumers do not pay their dues on time and few of them may not pay at all. In this case, the utilities have a risk of late payment and nonpayment of dues. The Table 8.7 explains that how far the utilities are successful in controlling risks related to debtors. 95.5% of respondents stated that they are efficient in controlling risk, while 4.5% of respondent indicated that they are not efficient in controlling risk related to debtors.

Table No.8.7: Efficiency in Controlling Risk Related to Debtor's

	Percent
Efficient	95.5
Efficient Nor Inefficient	0.0
Inefficient	4.5
Total	100.0

8.12 Collection Efficiency of Debtors

Collection efficiency is the actual revenue collected by the utility for the specific period. Efficiency in the collection of debtors explains how far the utilities are successful in collecting the dues pending from the consumers for the usage of electricity. The higher collection efficiency of debtors means lesser losses and vice-versa. .

Table No.8.8: Collection Efficiency of Debtors

	Percent
Efficient	77.3
Efficient Nor Inefficient	18.2
Inefficient	4.5
Total	100.0

The Table 8.8 indicates the respondents' view on the collection efficiency of power distribution utilities. A majority of respondents (77.3%) said that they were efficient in collecting debtors from consumers while 18.2% said that collection efficiency is satisfactory. Only 4.5% believed that their utility is not efficient in collecting dues from consumers.

8.13 Do You Think That You Can Reduce the Credit Period?

The question enquires whether there is any possibility of reducing the credit period granted to consumers or not. The Table 8.9 shows that 22.7% of respondent believed in reducing the credit period to improve timely payments of dues. A majority of respondents (68.2%) stated that credit period cannot be altered and hence it does not lead to improvement in timely payment of dues or efficiency.

Table No. 8.9: Do You Think That You Can Reduce The Credit Period?

	Percent
Yes	22.7
No	68.2
Don't Know	9.1
Total	100.0

8.14 You Think That You Can Provide Cash Discount to Consumers

A cash discount is a deduction allowed by the seller/service provider the goods or service in order to encourage the customer or consumers to pay within a due date. The Table 8.10 shows whether cash discount should be allowed to consumers for timely payment of dues or not. A little more than half of the respondents stated that cash discount should be allowed for consumers to improve timely payment of dues, while 45.5% of respondents felt that providing cash discounts may not be useful in improving timely payment of dues.

Table No. 8.10: Do You believe that Cash Discounts Should Be Allowed to Debtors for Timely Payment of Dues?

	Percent
Yes	54.5
No	45.5
Total	100.0

8.15 You Think That Heavy Penalty Should Be Levied for Late Payments

The penalty is the extra amount imposed on the bill amount of the consumers for payment of dues beyond the scheduled due date. The Table 8.11 shows whether the heavy penalty should be levied to consumers who pay after the due date. A majority of the respondent (72.7%) believed that imposing a heavy penalty will be helpful in pushing the consumers to make timely payments. To avoid extra financial

burden, the consumers will make an attempt to do timely payments. 22.7% respondents said that heavy penalty should not be levied to consumers because the consumers may not make a payment due to the poor financial position. Therefore penalty creates more burdens on consumers.

Table No.8.11: Do You Think that Heavy Penalty Should Be Levied for Late Payments?

	Percent
Yes	72.7
No	22.7
Don't Know	4.5
Total	100.0

8.16 Bad Debts

A bad debt is the amount owed by the consumers that are unlikely to be paid. The Table 8.12 shows the respondents, experience of bad debts in sample utilities. 18.2% of respondents agreed that they experience high bad debts while 68.2% respondents believed that utilities experience lower bad debts. Only 13.6% of respondents felt that the utilities are experiencing neither high nor low bad debts. According to the respondents, the utilities which are experiencing lower bad debts are managing debtors efficiently whereas the utilities which have high bad debts should improve their collection efficiency and adopt strategies from utilities which have proved efficient in managing bad debts.

Table No.8.12: Management of Bad Debts

	Percent
Experience High Bad debts	18.2
Neither High Nor Low	13.6
Experience Lower Bad debts	68.2
Total	100.0

8.17 Bad debts Contribution by Consumer Classification

The consumers in Power distribution utilities are broadly classified into industrial, agricultural, domestic, commercial and government. The consumers are classified based on the purpose of Electricity usage. The Table 8.13 shows the classification of bad debts, according to the type of consumers.

8.17.1 Industrial Consumers

The Table 8.13 shows the views of respondents based on the contribution of bad debts by industrial consumers. 22.7% of respondents agreed that industrial consumers contribute to high bad debts while 77.2% did not believe. One-third of the sample respondents neither agreed nor disagreed to the given statement.

8.17.2 Agricultural Consumers

The Table 8.13 illustrates the contribution of bad debts by agricultural consumers in power distribution utilities. A majority of sample respondents (72.7%) stated that agricultural consumers contributed to high bad debts while 18.2% of respondents affirmed that agricultural consumers pay their dues and did not contribute to high bad debts.

Table No.8.13: Classification of Bad Debts Based on Consumer Category

	Agree	Neither Agree nor Disagree	Disagree	Total	Rank
Industrial consumers contribute to high bad debts	22.7	9.1	77.2	100.0	4
Agricultural consumers contribute to high bad debts	72.7	9.1	18.2	100.0	1
Domestic consumers contribute to high bad debts	59.0	9.1	31.8	100.0	2
Commercial consumers contribute to high bad debts	27.3	22.7	50.0	100.0	3
Government	13.6	18.2	68.2	100.0	5

8.17.3 Domestic Consumers

The Table 8.13 explains the contribution of bad debts by domestic consumers in power distribution utilities. The majority of the respondents (59.1%) felt that domestic consumers contributed to high bad debts whereas 31.8% did not feel the same. Few of the respondents i.e. 9.1% of respondents neither agreed nor disagreed with the statement.

8.17.4 Commercial Consumers

The Table 8.13 shows the contribution of bad debts by commercial consumers in power distribution utilities. 50% of the respondents disagreed that commercial consumers' contributed to bad debts, while 27.3% agreed and 22.7% of respondents neither agreed nor disagreed with the statement.

8.17.5 Government Consumers

The Table 8.13 shows the contribution of bad debts by Government consumers in power distribution utilities. When asked whether government enterprises contribute to high bad debts, 68.2% of the respondents disagreed, whereas 18.2% neither agreed nor disagreed, and 13.6% agreed with the statement. This indicates that the government enterprises' contribution to bad debts is less. The government enterprises do not default payment, but they make very late payments to the power distribution.

8.18 Provision for Bad Debts

A utility may not be able to recover its balance outstanding in respect of certain receivables. In accountancy, such receivables are considered to be doubtful or irrecoverable bad debts. The recoverability of some receivables may be uncertain, although not definitely irrecoverable. Such receivables are known as doubtful debts. Therefore, utilities create a provision for such uncertain bad debts and it is known as provisions for bad debts. The allowance for doubtful debts reduces the receivable balance to the amount that the entity actually estimates to recover in the future.

The Table 8.14 shows the view of respondent whether the utilities have provision for bad debts or not. It indicates that 90.9% of the firms have provision for bad debts, whereas 4.5% of the respondents said that they do not have provision and another 4.5% of them said that they are not aware of the provision for bad debts. Based on the respondents' answers, we can clearly states that most of the firms have provision for bad debts.

Table No. 8.14: Does Your Firm have Provision for Bad Debts?

	Percent
Yes	90.9
No	4.5
Don't Know	4.5
Total	100.0

8.19 Aging Schedule of Debtors

The debtors aging schedule help the utilities to classify a part of the payments which are pending beyond the due dates and identify the set of consumers who do not pay their dues on time. Prolonged dues from consumers indicate fewer chances of recovering dues. It indicates that some of the utilities in receivables accounts have serious problems in collections. Aging schedule provides more information than the average collection period and clearly marks the slow paying debtors and helps the utilities to have

knowledge about the volume of debtors lying, according to the length of the debtors pending over a period of time.

8.19.1 Most of the Consumers Pay their Bills before Due Date

The Table 8.15 shows the respondents view on payments made before the due date. According to the respondents, most of the consumers i.e. 68.2% of them pay their bills before the due date, 4.5% of respondents neither agreed nor disagreed and 27.3% of them disagreed with the statement.

Table No.8.15: Aging Schedule

	Agree	Neither Agree Nor Disagree	Disagree	Total
Most of the consumers pay their bills before due date	68.2	4.5	27.3	100.0
Large number of consumers pay their bills with Surcharge	18.2	18.2	63.6	100.0
Your firm has high amount of debtors lying above 6 months.	45.4	18.2	36.4	100.0
Higher amount of debtors are written off after 6 months.	4.5	0.0	95.5	100.0

8.19.2 Large Number of Consumers Pays their Bill with Penalties.

The Table 8.15 shows the responses to the statement 'whether large numbers of consumers pay their bill with penalties'. A large number of respondents i.e. 63.6% disagreed, while 18.2% of them agreed and 18.2% neither agreed nor disagreed with the statement. As most of them don't pay the bill with a penalty, it means they are paying the bill on time but 18.2% of respondents viewed that consumers pay lately with surcharge.

8.19.3 High Amount of Debtors Lying Above Six Months

The Table 8.15 shows responses to the statement 'whether a high amount of debt is lying above six months' or not. It shows that, 45.4% of respondents agreed that high amount of debtors are lying above six months, 18.2% of respondents neither agreed

nor disagreed while 36.4% of them disagreed with the statement. It is inferred that a good amount of debts are laying beyond six months, therefore the utility should take prompt measures to control and devise new strategies to reduce the volume of debts.

8.19.4 High Amount of Debtors are Written Off After Six Months

The Table 8.15 shows view of respondents to the statement 'whether a high amount of debtors are written off after six months' or not. 95.5% of the respondents disagreed with the statement indicating that firms do not write off the debtors after six months. While few firms write off the debtors after six months as 4.5% of them agreed. This indicates that the firms don't want to lose their consumer or they give some more time to the debtors to pay the bill.

8.20 Effective Collection Mechanism

There are different collection mechanisms used by utilities operating in each state. The collection mechanisms help in collecting debts from consumers. They can make payments of their dues at any one of the collection systems. Collection systems used by utilities are spot collections, online payment, Payments through e-sevas or e-Kendras and payments through electricity offices or centers. According to their convenience and availability of collection system, consumers make their payment when they come due.

8.20.1 Spot Collections

In spot billing, collection-agent bills the consumers at their doorstep. The agent uses point of sale device to record the meter reading. The agent gives the recorded bill to the consumers for making payment for the electricity used. The agent also insists the consumers make payments on the spot. It is most effective in collecting dues from the consumers who make late payments regularly.

The Table 8.16 shows the efficiency of spot collection method. A larger part of respondents (81.8 %) said that it is a good method of collection of dues from consumers, whereas 18.2% respondents said that it is not an effective collection mechanism in their respective utilities.

Table No.8.16: Effective Mechanism Used for Collection of Debtors

	Effective	Neither Effective Nor Ineffective	Ineffective	Total
Spot collections	81.8	0.0	18.2	100.0
Online payments through Bank	77.3	0.0	22.7	100.0
Payments through ESEVA / Kendra's	81.8	18.2	0.0	100.0
Electricity office	100.0	0.0	0.0.	100.0

8.20.2 Online Payments

Online payments can be made through many banks; with the help of agencies like 'billjunction.com' and bill desk. Online payments can be made through the utility website. The consumers can login into utility's website and make payments easily. This is most popular among the working class people.

The Table 8.16 demonstrates the opinion related to the efficiency of online payments made by the consumers for the electricity used. 77.3% of respondents agreed while 22.7% disagreed that online payments are an effective method of collecting dues from the consumers. Further, the respondents clarified that online transactions are useful only in urban areas and are not suitable in rural areas where majority of population is illiterate and does not have facilities for online transactions.

8.20.3 Payments through E-Seva or E-Kendra's

E-Seva or E-Kendras or E-Jan Seva Kendras are an indigenously developed in-house system, on behalf of various service providers of utility to collect payments. The utilities have tie-ups with E-Seva centers where the customer can pay the bills anywhere in the city. In Karnataka and Andhra Pradesh the services are known as E-Seva while it is identified as E-Jan Seva Kendra in Gujarat, Jana Seva Kendra in Odisha, and E-Mitra in Rajasthan.

The Table 8.16 explains the effectiveness of payments received through E-Seva or E-Kendra. A majority of respondents (81.8%) felt that it is an effective method

while 18.2% viewed that it is neither effective nor ineffective in collecting debtors from consumers. It is an effective method because E-Seva and E-Kendra are widely located in every part of the state and are at the reach of common people. Further, it gained popularity due to its convenience and easy access to the consumers.

8.20.4 Payments through Electricity Office

The Table 8.16 presents whether payments at electricity office are an effective way for collections of debtors. All the respondents believed that receipts of dues from consumers at electricity office are the most effective method of collections. The respondents viewed that consumers might feel secured by making payments at electricity office.

8.21 Effective ways to Control Defaulters

The management and control of debtors is a very complicated task. Some customers pay their bills on time and a few make payments after the due date and a few do not pay at all. The problem arises with the last set of consumers who pay their bills after due date and consumers who do not pay at all. There is a cost associated with the late payments and default consumers who do not pay at all. Therefore the financial manager should formulate an efficient collection policy to reduce late payments and avoid default risk.

Controlling defaulters in domestic, commercial, industrial, agricultural and government consumers are a difficult task. A fraction of consumers, especially in rural areas believed that electricity is their right and it is a free commodity; hence they do not make payments. As a last resort, sometimes the government announces scheme aiming to bring the non-paying consumers back into the category of bill payers and save the power distribution agencies from further losses. But before announcing such schemes, the utilities must ensure that they have used all the means to collect debts from a different set of consumers. The Table 8.17 explains the effective ways to control defaulters.

8.21.1 Sending Reminder Letters

If the payments from consumers are not received even after the due date, a gentle reminder letter should be sent to the consumer's billing address. It should be mentioned that the consumers may become delinquent and therefore the bill payment should be made within a specified period, otherwise, action will be taken against the consumer by disconnecting the service.

A majority of respondents (90.9%) agreed that sending reminder letters to consumers would be effective in controlling defaulters, hence resulting in reduced bad debts. Only a small proportion (9.1%) neither agreed nor disagreed with the statement.

Table 8.17: Effective ways to Control Defaulters

	Agree	Neither Agree Nor Disagree	Disagree
Sending reminder letters	90.9	9.1	0.0
Place a phone call	63.6	22.7	9.1
Collection agent at door step	77.3	13.6	9.1
Sending Legal Notices	63.6	27.3	9.1
Disconnection of electricity	100.0	0.0	0.0

8.21.2 Place a Phone Call

A phone call can be placed to the consumers who default to make their dues on time, even after a reminder letter has been sent and no responses are received from the consumer. Further emphasis should be given to pay the bill before the matter is turned over to the legal action team.

The Table 8.17 shows the respondents' view on whether placing a phone call would be effective or not in controlling defaulters. 63.6% believed that placing a call would be effective in collecting dues from defaulters while 13.6% felt that it would not be effective because placing a call to default consumers would increase the cost expenditure of the utility. About 22.7% viewed that the idea of placing a call to default consumer's may or may not be effective.

8.21.3 Collection Agent at Door Step

Collection by an agent at consumer's doorstep is an effective way to control defaulters. It is useful in maximizing recovery by identifying consumers who are either likely to pay back with the least effort or who have the highest billing amount pending.

The Table 8.17 shows the respondent view on 'whether sending a collection agent at defaulter's consumers doorstep would be effective' or not. Most of the respondents (77.3%) believed that sending a collection agent would turn out to be effective. The agent will explain in detail the consequences of nonpayment of dues to the consumer, identifies whether the defaulter is a position to make payment and if possible he can collect the dues there itself and thereof. Only 9.1% believed that it may not be an effective method to control defaulters, where as 13.6% of respondents could not come to proper conclusion.

8.21.4 Sending Legal Notices

Legal or official notices are notification to take legal action against the set of willful defaulters of electricity dues. The notices are issued to consumers and a 15 days window period is given for the consumers to clear their pending dues. Even after the issue of legal notice, if consumers don't apprehend to the norms thereafter, the utility can resort to legal action.

Three-fourth of respondents viewed that sending legal notices would result in reducing defaulters. When the utilities send legal notices, the default consumers will by and large make payments and attempt to avoid legal action. Only 9.1% believed that sending legal notices will be effective when the dues of bills are high.

8.21.5 Disconnection of Electricity

The distribution utilities deal with the non-paying defaulters at their own level. Effective disconnection of defaulters should be a norm rather than a chance occurrence. However, if the defaulters do not pay total bills inspite repeated appeals, then the supply of electricity should be disconnected. Among them, a fraction of consumers who defaulted regularly may be disconnected permanently.

The Table 8.17 shows the view of respondent regarding the disconnection of electricity to the consumers who have not cleared dues. All respondents viewed that disconnection would be the best way to control defaulters. Once the electricity connection is disconnected, the consumers will clear their dues immediately.

8.22 Problem in Management of Debtors

There are several problems associated with the management of debtors in utilities such as power distribution. Efficient management of debtors leads to reduced collection efficiency and increased receivables in days. Some of the issues which are highlighted are inadequate metering, inaccurate billing, revenue leakage due to unbilled, delayed receipt of subsidy, late payments from consumers and lack of proper collection mechanism. The Table 8.18 explains the problems in the management of debtors.

8.22.1 Inadequate Metering

Electricity Metering is an electrically powered device to measure the amount of electric energy consumed by a consumer. Adequate metering will help in providing clear and comprehensive information on energy consumed whereas inadequate metering is an obstacle in managing the supply and consumption of energy leading to poor management of revenue.

The Table 8.18 shows the opinion of respondents on the issue of inadequate metering in handling debtors. Most of the respondents (68.2%) agreed that inadequate metering hinders the management of debtors while 31.8% of them felt that the management has adequate metering in their respective utilities. The respondents felt that 100 percent metering is not available in the rural areas which hampers the ability of the utilities to raise bills to the consumers. Therefore adequate metering will improve the volume of debtors and the probability of collections of dues.

8.22.2 Inaccurate Billing

One of the important jobs of utilities is to measure accurate billing from electric meters as it helps the consumers to pay exactly for what they used. The Table

8.18 reveals whether inaccurate billing hinders the management of debtors. 81.8% agreed while 9.1% disagreed that inaccurate billing hinders the management of debtors.

8.22.3 Revenue Leakage Due to Unbilled

The major challenge utilities face with revenue assurance are identifying the key sources of loss and quantifying the revenue leakage. The problem of revenue leakage due to unbilled can be reduced by establishing robust procedures that identify and scrutinize the reasons of revenue leakage and facilitate accurate recovery of revenue. Further revenue leakages need to be captured to enable constant growth of profit.

The Table 8.18 shows whether the revenue leakage due to unbilled will hinder the management of debtors. It shows that 59.1% of respondents agreed while 27.3% of respondent disagreed that a revenue leakage hinders the management of debtors.

Table No. 8.18: Problems in Management of Debtors

	Agree	Neither Agree Nor Disagree	Disagree	Total
Inadequate metering	68.2	0.0	31.8	100.0
Inaccurate billing	81.8	9.1	9.1	100.0
Revenue leakages due to unbilled	59.1	13.6	27.3	100.0
Late receipt of Subsidies from government	77.3	13.6	9.1	100.0
Late payment by customers	77.3	4.5	18.2	100.0
Bad debts issues	68.4	5.3	26.3	100.0
Lack of appropriate collection mechanism	42.1	0.0	52.6	100.0

8.22.4 Late Receipt of Subsidies from Government

Late receipt of subsidies will also lead to liquidity stress due to delayed realization of subsidies from the government. In the case of non-disbursal of subsidy by government, the carrying cost is not considered from State Government. The carry cost is

to be borne by respective utilities. Further non-receipt of subsidy from the government will increase receivables in respect of power distribution utilities.

The Table 8.18 shows the respondents' view whether late receipt of subsidies from the government will hinder the management of debtors. 77.3% of respondents agreed that late receipts of subsidies from government have an effect on the management of debtors. Only 9.1% disagreed with the statement while 13.6% neither agreed nor disagreed.

8.22.5 Late Payments from Consumers

Late payments from consumers are one of the reasons for inefficient management of debtors. Non-payment of electricity bills by consumers will create liquidity problems and further increase the cost of holding debtors. In the case of payments getting delayed by the consumers, a surcharge is charged on the due amount from consumers.

The Table 8.18 illustrates whether late payments by consumers will hinder the management of debtors or not. A majority of consumers agreed that late payment by consumers will have an effect on the management of debtors because it will increase the holding cost of debtors from the perspective of utilities. A small proportion of respondents (18.2%) disagreed that late payments by the consumer will have any effect on management of debtors.

8.22.6 Bad Debt Issues

A utility generally takes about 15 days to 2 months depending upon the consumer category to bill the consumers for the electricity used. The bad debts of the utility increase, as large percentage of consumers prefer not to pay even after the receipt of the bills for the energy consumed. The unpaid electricity bills are a financial burden for power distribution utilities.

The Table 8.18 shows the respondents' view whether bad debts will hinder the management of debtors or not. 68.4% of respondents agreed that bad debt issues will hinder management of debtors while 26.3% disagreed with the same statement.

Therefore, the utilities must find methods to decrease the revenue losses from non-payment of dues billed. Hence, collecting bad debts from unpaid bills should be the first priority of these utilities. Further, the utilities should motivate consumers to pay in advance before the consumers actually use the energy and therefore reducing the chances of bad debts.

8.22.7 Lack of Appropriate Collection Mechanism

Collection mechanism is a system or method to collect revenues for the billed amount from electricity consumers. An appropriate collection mechanism will increase the chances of improving collection from consumers.

The Table 8.18 shows whether lack of appropriate collection mechanism will hinder the management of debtors. A little less than half of the respondents agreed that inappropriate collection mechanism will hinder the management of debtors while 52.6% of them disagreed.

New techniques should be implemented to improve revenue sustainability by improving the collection mechanism. Suitable methods or processes should be evolved in both rural and urban areas. Both urban and rural areas have unique characteristics of consumers, due to which the collection methods should also be unique. In urban areas, technology can be used whereas awareness should be created to get better revenue collections in rural areas.

8.23 Critical Success Factors In Reducing Non-Payment of Dues

The following are critical factors that will help in reducing the nonpayment of dues from consumers. The Table 8.19 provides the respondents' view on the following.

8.23.1 Prepare Aging Schedules of Debtors on Regular Basis to Take Prompt Action

The Table 8.19 describes whether preparing an aging schedule of debtors on a regular basis to will lead to prompt action against the unpaid consumers. All the respondents agreed that aging schedule will help in taking prompt action against the late payers and defaulters.

8.23.2 Assessing the Creditworthiness of Consumers Prior to New Connection

The Table 8.19 describes whether creditworthiness of the consumers should be evaluating before granting new connection or not. 72.7% of respondents agreed that assessing the creditworthiness of the new consumer will improve the efficiency of debtors while 22.7% said that they disagreed by stating that it is not possible to assess the creditworthiness of the consumers nor it is accepted according to the norms of regulatory commission. Two months advance are received from the new consumers, to reduce the chances of non-payments in future. Further, whenever a consumer applies for a new connection, the distribution utilities are obliged to supply electricity without any hurdles.

Table No.8.19: Critical Success Factors In Reducing Non-Payment of Debtors

	Agree	Neither Agree or Disagree	Disagree
Prepare Aging Schedules of Debtors on Regular Basis to Take Prompt Action	100.0	0.0	0.0
Assess Credit Worthiness of Consumers Prior to New Connection	72.7	4.5	22.7
Employing factoring services	36.4	4.5	59.1
Providing Flexible Billing Cycle	45.4	18.2	36.3
Incentives for Timely Payment	68.2	0.0	31.8
Prioritize Delinquent of Accounts for Collection Follow Ups	100.0	0.0	0.0
Provision for Real-Time Access to Consumers Information	90.1	0.0	9.1

8.23.3 Employing Factoring Services

The Table 8.19 presents whether employing factor services will improve the efficient management of debtors or not. 36.4% believed that employing factoring services in utilities will lead to an increase in debtor's collection and revenue enhancement. A majority of respondents i.e., 59.1% said that employing factoring

services is not useful in boosting the management of debtors. The third party or factor services were utilized by Gujarat power distribution utilities, to help in collecting the nonpayment of dues from a different set of consumers but it was not successful. The respondents opined that political parties pressurize the power distribution utilities not to stress the consumers for collecting dues due to political gains.

8.23.4 Providing Flexible Billing Cycle

The Table 8.19 reveals the respondents' opinion whether providing flexible billing cycle will improve the efficient management of debtors. With reference to information provided, 45.4% of respondents agreed that providing flexible billing cycle to consumers will improve the efficiency of debtor's management. 18.2% of respondents said that they neither agreed nor disagreed but 36.4% of respondents disagreed viewed that providing a flexible billing cycle will not induce collections from consumers.

8.23.5 Incentives for Timely Payment

Timely payment of dues from consumers will be an advantage, if all the consumers make their payment for the electricity used. It is practically not possible because there are few pockets of the society which do not pay their dues due to financial reasons. To motivate consumers to make payments before the due date, they should be induced by providing incentives. The incentives can be in the form of cash discount.

Whether offering incentives will lead to timely payment of dues from consumers is shown in the Table 8.19. About 68.2% of the respondents agreed that providing incentives will induce the consumers to make prompt payments while 31.8% believed that providing incentives will not provoke the consumers to make payment before due date.

8.23.6 Prioritize Delinquent Accounts for Collection Follow Ups

The Table 8.19 shows whether prioritizing delinquent accounts of consumers for further follow-up will lead to success in the management of debtors or not.

All the respondents agreed that prioritizing regular offender and making regular follow-up will improve in collection of pending from consumers.

8.23.7 Provision for Real-Time Access to Consumers Information

The Table 8.19 shows respondent opinion on whether creating a provision for real-time access to consumers' information will improve the management efficiency of debtors or not. About 90.9% of respondents agreed that providing real-time access to consumer information will help in analyzing the consumer's information such as energy usage, payment pattern, history of late payment etc. Therefore the billing agent can have a more aggressive approach towards the collection of dues from such consumers. A small proportion of respondents i.e., 9.1% disagreed that creating a provision may not be useful in improving collections.

8.24 Conclusion

The chapter deals with the management of debtors in power distribution utilities in India. The main aim of debtor's management is to reduce risk. According to the respondents, the consumers should be levied heavy penalties who do not pay on time and further cash discounts should be allowed to consumers who pay their dues timely. It is also found that agricultural consumers are a major concern of bad debts and government entities are the late payers of dues. The critical success factors in reducing non payments of dues are preparing aging schedule, inaccurate billing, prioritize delinquent consumer accounts for collection follow-up, late receipt of subsidy from the government debtors effectively and efficiently.

CHAPTER IX

FINDINGS & CONCLUSION

9.0 This section elaborates on the findings, suggestions and scope for further research.

9.1 Findings of the study

The findings of the study are as follows:

Liquidity

The utilities are not maintaining consistent working capital balances over the period of the study and half of the utilities have negative working capital, indicating that utilities are managing with lesser current assets in comparison to current liabilities. The utilities with negative working capital are using short term funds for long term purpose.

The overall liquidity position of power distribution utilities is not appropriate. Most of the utilities are maintaining current ratio less than 1:1. It indicates that utilities have a serious problem of liquidity. None of the utilities have an ideal absolute liquid ratio. They have insufficient cash balances to meet the day-to-day expenses of the operation. Due to unavailability of cash, the payments are delayed to creditors.

It is found that, there is no significant difference in the management of liquidity among the private and state-owned enterprises in terms of current ratio and quick ratio but found a significant difference in management of cash in proportion to current liabilities among the private and state-owned utilities. It is also found that private utilities are having a higher margin of cash as compared with state-owned power distribution utilities. The low cash levels can be attributed to the nature of the industry.

The current ratio, quick ratio and absolute cash ratio are having a positive relationship with the return on capital employed. It shows that increase in liquidity will lead to increase the profitability of these utilities. It is found that there is a insignificant positive relationship between the liquidity ratios and return on capital employed.

Management Efficiency

The management efficiency can be analyzed by measuring the debtors' turnover ratio, collection efficiency and creditors' turnover ratio. The study found that the average debtor's period is more than 60 days for half of the sample power distribution utilities. Hence, most of the utilities have failed to collect their debtors from consumers, due to which their financial condition was worsened.

Utilities operating in Karnataka and Madhya Pradesh are having higher average collection period. These utilities bear the additional cost of carrying debtors until they are actually received in future. These utilities operating in Gujarat, Telangana, Andhra Pradesh and Rajasthan have low average collection period.

The average payable period is more than 90 days for more than half of the sample power distribution utilities. Only five utilities are making timely payments. Hence the credit paying ability of these utilities is not appropriate. The utilities which have higher average are having problem in making payments to generation and transmission utilities.

There are six power distribution utilities whose collection efficiency was found to be lower than 90%, it means that the utilities have failed to collect 10% of the revenue from the debtors. These uncollected debtors have a cost of holding them, due to which the utilities have to manage the additional cost of holding debtors, leading to higher expenses. There are six utilities namely, namely CESCO, CHECOM, HESCOM, MPMKVVCL and MPPVKVVCL are having collection efficiency less than 90%. This shows the management is inefficient in managing collection of debtors.

There is no significant difference in the management efficiency between private and state-owned utilities over the study period. The management efficiency can be judged by viewing indicators such as debtor's turnover ratio and creditor's turnover ratio. Therefore, the strategies and the manner in which debtors and creditors are maintained are no ways different between the two groups but it cannot be ruled out that there could be a difference within the groups. The efficient management has a faster collection process, high collection efficiency and timely payment of dues to creditors and lower bad debts whereas inefficient management will have a slower collection of debtor's, lower collection efficiency and higher bad debts.

The study found a significant positive relationship between the debtors' turnover ratio and ROCE. Therefore a decrease in average collection period will help in improving the profitability of the sample utilities. In other words, an increase in the debtor turnover ratio will lead to an increase in return on capital employed. Hence the collection period has to be reduced and debtors' turnover ratio should be improved to fasten collection process.

There is an insignificant relationship between the creditor's turnover ratio and profitability of the sample utilities but there is a low positive relationship. It means that the utilities should make speedy payments to creditor for improving the return on capital employed. The results are inconsistent with the generally accepted norms that payment must be delayed to creditors to increase profits.

The collection efficiency and return on capital employed are having a significant positive relationship between the two. An increase in collection efficiency will lead to increase in return on capital employed. Hence, the utilities should maximize their collection with respect to the expected revenue in order to increase the profitability of the firm.

Solvency

Eight utilities have revealed a negative debt to equity ratio, usually, means that the utilities are not been in profits. A negative debt equity ratio is an indicator that the utility has negative net worth signifying the utilities can be probably in financial problems. Except for five utilities among the sample utilities have either negative interest coverage ratio or ratio of less than 1.25. It shows that the management is inefficient in managing interest charged to outstanding debt. Hence, these utilities have difficulties in paying off its interest expenses with its earnings. There is no significant difference in the management of interest coverage ratio but debt equity ratio shows significant difference between the private and state-owned power distribution utilities over the study period.

The regression analysis showed that there is an insignificant positive relationship between the debt equity ratio and return on capital of the sample utilities. The study found a highly significant positive relationship between interest coverage ratio and Return on capital employed. It signifies that the utilities with a higher interest coverage

ratio are comfortable in paying off its interest on debt and therefore increases creditworthiness and profitability of the firms.

Profitability

The study found that half of the sample utilities are having either low or negligible average return on capital employed or negative average return on capital employed for the study period. On an average, the utilities are facing losses during the study period. It shows that the management has failed in running these utilities efficiently. It is also found that there is no significant difference in the management of profitability between the private and state-owned power distribution utilities.

Impact of Working Capital on Profitability

The regression analysis found that there is an insignificant impact of quick ratio, absolute cash ratio and creditor's turnover ratio on the profitability at 5% of significance. Debtor's turnover ratio is found to be having insignificant at 5% level of significance but can be accepted at 10% level of significance. In literature, receivables were found to be important element in power distribution utilities. Therefore debtor's turnover ratio is an important factor in improving the profitability of the utility.

It is found that there is a significant impact of collection efficiency and interest coverage ratio on the return on capital employed at 5% level of significance. Higher the collection efficiency, higher would be profitability. The increase in collections efficiency will lead to increase in profitability.

Working Capital Policy

According to the view of respondents, it is found that there is a relationship between working capital policy, receivables policy, cash management and profitability. Most of the utilities follow a formal working capital policy. The policy is formulated by top level and upper-middle-level management and two third of the respondents agreed that the lower level management is not considered while formulating working capital policy neither the policy is shared with them. They follow a situation approach of working capital policy and review it whenever necessary, according to the requirement of the

utility. Only half of the respondents have said that have an internal assessment for evaluating the efficiency of working capital policy. The evaluation of working capital policy efficiency can be determined by indicators, such as improvement in billing resulting in a higher turnover, improvement in the collection of revenue, and an increase in the consumer base.

Factors Determining Working Capital Management

Government regulations, consumer requirements, credit policy, payable policy, inventory policy, technology usage, business and economic environment, industry effect are the major factors which influence working capital management.

Working Capital Financing

Most of the utilities either follow matching approach or conservative approach. Bank loan and credit from suppliers are the major sources of working capital financing used by utilities. They procure finance by providing collateral security in the form of government guarantee, and hypothecation of inventory and receivables. Public sector banks and government provide working capital finance to power distribution utilities. The weak financial condition and performance, and high-interest rates lay difficulties while procuring working capital from financial institutions.

Cash Management

Cash management is of strategic importance for the operation of the utilities. Cash is maintained due to the requirement of the transaction motive. Little more than half the respondents prepare monthly cash budgeting. The variances in cash budgeting can be recorded sometimes in both receipt side and payment side. Most of the utilities maintain low cash levels.

Debtor Management

The main goal for debtor's management is to reduce risk. The utilities maintain a formal record keeping of debtor's data in practiced. Credit is granted to the consumers for providing service to public. Weekly meeting are held to discuss and solve issues related

to bad debts. Half of the utilities state that cash discounts should be allowed for improving timely payment of dues and three-fourth of the utilities state that high penalty should be levied on the consumers who do not pay on time.

One-fifth of the utilities experience high bad debts. According to the classification of bad debts, agricultural consumers are a major reason for bad debts followed by domestic, commercial, industrial and government. Generally, it is perceived that government agencies contribute to bad debts is not true. They default on time payment and discharge their dues very lately due to which the utilities have to bear the extra burden of holding debtors.

About 68.2% of respondents agree that bills are paid on time. From this, it can be inferred that still, one-third of the consumers do not pay their bills on time. It is reported that about 18.2% of consumers pay their bills with surcharge. 45.4% of respondents agree that a good amount of debtors are pending after six months and a very small proportion of the same are written off according to the policy of the utility.

The consumers prefer to make payments through electricity office, followed by e-seva or e-kendras, spot collections and online payments through banks and electricity bill desk. The utilities prefer to disconnect electricity followed by sending reminder letters, sending collection agents at the doorstep, sending legal notices and placing a phone call as an effective way to control defaulters of electricity bills by a different set of consumers. Further it is found that inaccurate billing, late receipt of subsidies from the government, late payment by customers, inadequate metering, bad debts issues, revenue leakages due to unbilled, lack of appropriate collection mechanism are the key problems in the management of debtors effectively.

9.2 Suggestions to the Organization

These are few of the suggestions which are explained in the brief.

The average collection period should be reduced and collection efficiency should be improved to increase the profitability of utilities. Further increase in collection efficiency will reduce defaulters and reduce the cost of holding debtors. The average

collection can be improved by providing incentives to the consumers in the form cash discount for early payments.

Liquidity and creditworthiness go hand in hand. The cash balances to meet day to day expenses of the operation are lower. Hence, Liquidity should be improved to make timely payment to creditors, to meet day to day expenses and increase creditworthiness of power distribution utilities. The creditworthiness of the distribution utilities should be improved to make timely payment of interest and payments to creditors to enhance uninterrupted power generation and transmission of electricity.

Field staff should be included in the formulation of working capital policy and further policy should be shared with them.

Utilities should improve performance to strengthen the financial position. They will help in easy procurement of working capital finance.

The utilities are suggested to improve cash levels for smooth running of the business operations. The strategy such as accelerating cash inflows and delaying cash outflows will help in optimizing cash management. Only a few utilities have stated that they have excess idle cash, it is suggested that these utilities invest their excess cash margins in short term securities.

Collection from agricultural and domestic consumers should be faster. Government bodies should heavily penalized for delaying payments. Furthermore, late payments should be levied with high surcharge, to reduce late payments and improve cash balances. Debtors pending above six months should be dealt severely. Collection agencies should be appointed to collect long term pending dues.

These specific suggestions help in improving the collection efficiency of power distribution utilities.

These are few of the suggestions which are explained in the brief.

Timely Collection from Government Institutions

The utilities should ensure that they collect revenues from government organizations. These institutions clear their electricity dues very lately, and no additional interest or carrying cost is considered from State Government. The dues from these set of consumers are very high. Hence, timely receipts of such dues will enable the utilities to reduce their expenses and solve liquidity problem.

Political Intervention should be Avoided

Due to political intervention, disconnection of electricity connection is not managed efficiently. The local leaders put pressure on the field officers to restrict themselves from disconnecting electricity connection. Therefore, the utilities should avoid any political intervention from political parties in accomplishing their obligations.

Political will should be Available

The government should support the utilities in collecting their dues. They should understand that electricity is not a free commodity; hence payments should be made on part of consumers. The government should take concrete steps to improve tariff revision and application of minimum tariff to all the set of consumers. This will enable the consumer to pay minimum charges, instead of providing electricity at free of cost.

Tariff Setting

Tariff filing should be done timely to avoid postponement of revised tariff for the respective annual year. The non-filing and delay in average revenue realization and tariff revision will impair the ability of distribution utilities to raise tariffs, further eroding their poor financial health. On the other hand, the utilities also avoid disclosing their financial and technical cost structures by not filing average revenue realization petitions; therefore

State electricity regulatory commission do not have sufficient and accurate information to arrive at reasonable tariffs. As a consequence, public participation in the regulatory tariff process is significantly reduced. Therefore the public ends up with less bargaining and negotiating power with regard to better services and reasonable tariffs.

The delay in filing realization of average revenue must be avoided from the utility end. Generally, Utilities submit average revenue realization petition lately leading to delay in revision of tariff. The delay in submission of the petition will lead to the lower tariff, leading to losses over the specific time period. Hence the state utilities should file ARR's on time to receive tariff orders from state electricity regulatory commission.

Frequent Follow-up and Monitoring Unauthorized Connection

Frequent follow-up should be done to reduce dues from late payers and defaulters. Further unauthorized connections and power theft are the main causes of T&D losses. Unauthorized use of power in villages through illegal means results in frequent transformer failures, poor voltage stability and poor reliability of supply.

A team of four or five members should be assigned to an area with the task to study, follow-up, recover dues from respective consumers and control unauthorized connections. Modernize the regularization system will reduce the effort and time required to inspect and follow-up on irregularities.

Usage of Technology

Involving technology like photometer reading, prepaid metering, smart meter etc. will improve proper management of debtors. Smart meters can collect data for remote reporting, unlike home energy monitors. Such as Advanced Metering Infrastructure (AMI) differs from traditional Automatic Meter Reading (AMR) as it enables two-way communications with the meter. Government agencies and utilities are turning toward advanced metering infrastructure (AMI) systems as part of larger "Smart Grid" initiative. This will help in enabling the utilities to reduce the losses and proper monitoring of metering. Consumer Analysis Tool (CATs) is a customer database used to analyze customer information in order to identify trends in metering, billing, and collections.

Monitoring and Tracking System (MATs) has been designed as a tool to assist the process of monitoring and tracking of the progress of various cases of irregularities, like theft, malpractice, back-billing etc.

Role of Post Office as a Collection Centre

The post office can play a crucial role in collecting dues from the consumers. It plays a vital role, especially in rural areas. Post offices are popular in rural areas; hence the facilities of the same can be used without incurring any additional cost on the part of utilities.

Gram Panchayat as a Mode of Collection

Gram Panchayat is the basis of a local self-government organization in India of the Panchayati Raj System at the village or small town level and has a Sarpanch as its elected head. It is decentralized and participatory local self-government through Panchayati Raj Institutions (PRIs). These institutions exist in all the rural areas. These organizations can be used as a procedure for collection of dues at the village level, so that maximum effort are put to improve efficiency and on the other hand reduce nonpayment of pending bills at the village level.

Cooperatives Society as a Collections Centre

A cooperative society is formed to ensure democratic function and to protect the interests of members in the Cooperative Societies according to the Cooperative Act. The people from the district can pay their electricity bills at select cooperative societies. These cooperatives have service counters like collection of electricity bills on behalf of power distribution utilities. The payment of electricity bill through select Cooperative Societies had been facilitated towns and villages for the benefit of rural population to increase the efficiency of the collection at rural areas.

Provide Facilities for Making Payments through E-commerce and M-commerce

E-commerce is trading in products or services using computer networks, such as the Internet whereas M–Commerce is the use of wireless devices such as phones and

laptops to conduct commercial transactions online. It enables the user to commence the transaction in a simple and timely manner and is simple, safe, secure and time saving to the consumers.

M-Commerce services are used for paying electricity bills by consumers of power distribution utilities. The consumers can pay their electricity bill through their mobile phones. The Bihar government has signed an agreement with Airtel subsidiary company for providing mobile phone service for payment of electricity bills by consumers in north Bihar. The use of mobile phone payment facility for electricity bills, the consumers will be able to save time by using it.

Massive Disconnection Drive

The utilities should start a massive disconnection drive to improvise collection and reduce the level of defaulters. Further, verification of by-passing cases should be brought to notice and legal action should be taken against the regular offenders.

To Implement Revenue Recovery Act

For the realization of arrears, revenue recovery act has to be implemented properly, duly following all the procedures for effective implementation. Revenue Recovery Act is being used to realize power bill dues, and therefore the staff should act on time to ensure that the utilities recover the dues. It is useful to recover dues from industrial consumers where recovery amount is high.

Credit Insurance

It protects against both commercial and political risks that are beyond the control of the utilities. It helps the utility to grow profitably, minimizing the risk of sudden or unexpected customer insolvency. In other words, it safeguards the utility against the failure of consumers to pay their debts owed to respective utilities.

9.3 Scope for Further Research

- ✓ Comparative studies can be done on private and public owned power distribution utilities.
- ✓ Research can be carried out using case study on private owned or public owned power distribution utilities, which are running successfully after unbundling.
- ✓ Research can be carried out by increasing the sample size and the period of the study.
- ✓ Research can be carried on the impact of short-term, long-term financial variables on the profitability of utilities.

BIBLIOGRAPHY

Abbasali, P. & Milda, E. (2012). Impact of working capital management on profitability and market evaluation: evidence from Tehran Stock Exchange. *International Journal of Business and Social Science,* 3(10).

Afeef, M. (2011). Analyzing the impact of working capital management on the profitability of SME's in Pakistan. *International Journal of Business and Social Science, 2*(22).

Afza, T., & Nazir, M. S. (2007). Is it better to be aggressive or conservative in managing working capital. *Journal of quality and Technology Management*, *3*(2), 11-21.

Al-Shubiri, F. N. (2010). Analysis of the relationship between working capital policy and operating risk: An empirical study on Jordanian industrial companies. *Investment Management and Financial Innovations*, *7*(2), 167-176.

Al-Taleb, G., & Zoued, A. A., & Shubiri, F., N.(2010). The determinants of effective working capital management policy: A Case study on Jordan. *Interdisciplinary Journal of Contemporary Research In Business*, *2*(4).

Alipour, M. (2011). Working capital management and corporate profitability: Evidence from Iran. *World Applied Sciences Journal,* 12(7), 1093-1099.

Agarwal, H. (1983). Efficiency of working capital and corporate profitability. *Financial Practice and Education*, *8*(2), 37-45.

Agha, H. (2014). Impact of working capital management on profitability. *European Scientific Journal*, *10*(1).

Ajmera, B. C., & Bhatt, R. J. (2011). Cash management of selected refineries in India : A note. *GITAM journal of ManagemenT, 9*(11), 156-168.

Ajanthan, A. (2013). Working capital management and corporate profitability: A Study of Selected Listed Companies in Sri Lanka. *International Journal Of Business & Management, 1*(2). .

Amjad, S., & Hasnu, S. A. F. (2010). Financing the current assets: approach followed by small and medium enterprises in Pakistan. *Interdisciplinary journal of contemporary research in business*, *2*(7), 136.

Appuhami, B. R. (2008). The impact of firm's capital expenditure on working capital management: An empirical study across industries in Thailand. *International management review, Vol. 4* (1), pp.8-21.

Arunkumar, O.N., and Radharamanan, T. (2013). Factors affecting working capital management of Indian manufacturing firms. *International Journal of Managerial and Financial Accounting, 5*(4)

Bagchi, B., Chakrabarti, J. & Roy, P. B. (2012). Influence of working capital management on profitability: A study on Indian FMCG companies. *International Journal of Business and Management, 7*, 1-10.

Bagchi, B., & Khamrui, B. (2012). Relationship between working capital management and profitability: a study of selected FMCG companies in India. *Business and Economics Journal*, 1.

Balasubramanian, S. (2012). The Discom Dilemma in India. *Energetica* India, December

Baltagi, B. H. (2001) *Econometric Analysis of Panel Dat*a (second ed.) John Wiley & Sons

Banerjee, (1997). *Financial Management.* Published by S.Chand & Company Ltd., New Delhi, Page No.74.

Belt, B., & Smith, K. V. (1991). Comparison of working capital management practices in Australia and the United States. *Global Finance Journal*, *2*(1-2), 27-54.

Ben-Caleb, E., Olubukunola, U., & Uwuigbe, U. (2013). Liquidity management and profitability of manufacturing companies in Nigeria. *Journal of Business and Management*, 9, 13-21.

Bhattacharyya, S. C. (2007). Sustainability of power sector reform in India: what does recent experience suggest?. *Journal of Cleaner Production*, *15*(2), 235-246.

Bhayani, D. S. (2004). Working Capital and profitability relationship -A case study of Gujarat Ambuja Cement Ltd. *SCMS Journal of Indian management* , 98-111.

Bhunia, Amalendu. (2007), "Liquidity management of sponge Iron India: A case Study", *Southern Economist*, *46*(15), pp 25-28.

Bhunia. A. (2010). A study of liquidity trends on private sector steel companies in India, *Asian Journal of Management Research,* 618-628.

Bhunia, A., Khan, I., & Mukhuti, S. (2011). A study of managing liquidity. *Journal of Management Research*, *3*(2).

Bhunia, A. and Brahma, S.B. (2011). Importance of liquidity management on profitability. *Asian Journal of Business Management, 3*(2), 108-117

Bhunia, A. and Khan, I.U. (2011). Liquidity management efficiency of Indian Steal companies: A Case Study. *Far East Journal of Psychology and Business, 3*(3), 3-13.

Bhunia, A. & Das, Amit. (2015). Underlying relationship between working capital management and profitability of Pharmaceutical companies in India. *American Journal of Theoretical and Applied Business*, *1*(1), 27-36.

Boisjoly, R. P. (2009). The cash flow implications of managing working capital and capital investment. *The Journal of Business and Economic Studies*, *15*(1), 98.

Brigham, E. F., & Houston, J. F.. (2015). *Fundamentals of Financial Management.* Cengage Learning, Business & Economics - 832 pages

Burns, R and Walker, J. 1991. A Survey of Working Capital Policy Among Small Manufacturing Firms. *The Journal of Small Business Finance, Vol 1* (1), pp. 61-74.

Carstairs, J., & Ehrhardt, D. (1995). Financial structure in the Indian power sector. *Energy Policy*, *23*(11), 981-990.

Central Electricity Authority (2015). *Growth of electricity sector in India from 1947-2015.* Ministry of Power. New Delhi

Chanchal (2014), The effect of working capital management on the profitability: A study on Indian cement industries, *International Research Journal of Commerce, Arts and Science, 5*(6). 118-128.

Charitou, M. S., Elfani, M., & Lois, P. (2010). The effect of working capital management on firms profitability: Empirical evidence from an emerging market. *Journal of Business & Economics Research (JBER)*, *8*(12).

Chatterjee, S. (2010). The impact of working capital management on the profitability of the listed companies in the London stock exchange. *Available at SSRN 1587249*.

Chatterjee, S. (2012). The Impact of Working Capital on the Profitability: Evidence from the Indian Firms. *Available at SSRN 2125228*.

Cheatham, L. R., Dunn, J. P., & Cheatham, C. B. (1989). Working capital financing and cash flow in the small business. *Journal of Business and Entrepreneurship*, *1*(2), 1.

Ching, H. Y., Novazzi, A., & Gerab, F. (2011). Relationship between working capital management and profitability in Brazilian listed companies. *Journal of global business and economics*, *3*(1), 74-86.

Chiou, J. R., Cheng, L., & Wu, H. W. (2006). The determinants of working capital management. *Journal of American Academy of Business*, *10*(1), 149-155.

Chowdhary, A. & Amin, M. (2007). Working Capital Management practiced in pharmaceutical companies listed in Dhaka Stock exchange. *BRAC University Journal, IV* (2), 75-86.

Cote, J. M., & Latham, C. K. (1999). The merchandising ratio: A comprehensive measure of working capital strategy. *Issues in accounting education, 14* (2), 255.

Dadhich, P.(2002). *Indian power sector*. Organization for the promotion of Energy Technology. Available at http://www.fe.doe.gov/international/indiaover.html.

Dasaraju,H. & Murthy.K.S.(2011). Efficiency of Indian power sector an analysis of its performance and problems. *IJMB*S, 1(3).

Dash.B.D, & Sangita, S.N. (2011). *Governance reforms in power sector: Initiatives and outcomes in Orissa,* working paper 262, ISBN 978-81-7791-118-3

D'Attilio, D. F. (1992). Net working capital forecasting at DuPont. *The Journal of Business Forecasting, 11*(1), 11.

Damodaran, A. (2012). *Investment valuation: Tools and techniques for determining the value of any asset* (Vol. 666). John Wiley & Sons.

Danuletiu, A. E. (2010). Working capital management and profitability: A case of Alba county companies. Annales Universitatis Apulensis: Series Oeconomica, 12(1), 364.

Deloof, M. (2003). Does working capital management affect profitability of Belgian firms?. *Journal of business finance & Accounting*, *30*(3Ğ4), 573-588.

Dong, H. P., & Su, J. T. (2010). The relationship between working capital management & profitability A Vietnam case. *International Research Journal of finance & economics, 49*, 62-71.

Dubbudu, R. (2016). *India's Per Capita Electricity Consumption lowest among BRICS nation.* Received from https://factly.in/indias-per-capita-electricity-consumptionlowest-among-brics-nations/

Economic Survey 2010-11 – Statistical Appendix. *Retrieved from http://indiabudget.nic.in/es2010-11/estat1.pdf*

Eljelly, A. M. (2004). Liquidity-profitability tradeoff: An empirical investigation in an emerging market. *International Journal of Commerce and Management*, *14*(2), 48
61.

Enqvist, J., Graham, M., & Nikkinen, J. (2014). The impact of working capital management on firm profitability in different business cycles: Evidence from Finland. *Research in International Business and Finance*, *32*, 36-49.

Erasmus, P. D. (2010). Working capital management and profitability: The relationship between the net trade cycle and return on assets. *Management dynamics*, *19*(1), 2.

Farris II, T. M., & Hutchison, P. (2003). Measuring cassh-to-cash performance. *The international journal of logistics Management , 14, 2*, 83-91.

Fatoki, O. (2014). Working capital management practices of immigrant entrepreneurs in South Africa. *Mediterranean Journal of Social Sciences*, *5*(10), 52.

Filbeck, G., & Krueger, T. M. (2005). An analysis of working capital management results across industries. *American Journal of Business*, *20*(2), 11-20.

Garg, P.K. (1999). *Working capital trend and liquidity analysis of the State Industrial Enterprises in India – A Case study, working capital management*, Edited by Rao Mohana D and Pramanik Alokkumar, *Deep and Deep Publications Pvt. Ltd*., New Delhi, pp. 26-42

Gentry, J. A., Mehta, D. R., Bhattacharyya, S. K., Cobbaut, R., & Scaringella, J. L. (1979). An international study of management perceptions of the working capital process. *Journal of International Business Studies*, *10*(1), 28-38.

Gibson, C. (2008). *Financial reporting and analysis: Using financial accounting information*. Cengage Learning.

Gill, A., Biger, N., & Mathur, N. (2010). The relationship between working capital management and profitability: Evidence from the United States. *Business and Economics Journal*, *10*(1), 1-9.

Gitman, L. J. (2000). *Principles of Managerial Finance*, 9th Edition, Addison Westley, Longman.

Gitman, L. J., Moses, E. A., & White, I. T. (1979). An assessment of corporate cash management practices. *Financial Management*, 32-41.

Goswami., & Sarkar, A. (2011). Analysis of financial performance of Tata Steel–A Case Study. *Zenith International Journal of Multidisciplinary Research*, *1*(5), 161-174.

Greene W.H. (2000). *Econometric Analysis.* Prentice Hall International, Inc., Upper Saddle River, New Jersey.

Gujarati, D. N. (2003). *Basic Econometrics*. 4th. New York: McGraw-Hill.

Gulia, R. (2014). Effects of working capital management on firms profits: Evidence from the Pharmaceutical sector, *International Journal of Management and Social Sciences Research (IJMSSR)*, 3(1).

Gupta. S. & Singh, S. (2012). *Indian power distribution Utilities.* CRISIL Risk & Infrastructure Solutions Limited. Mumbai

Gupta, J. P., & Sravat, A. K. (1998). Development and project financing of private power projects in developing countries: a case study of India. *International Journal of Project Management*, *16*(2), 99-105.

Gupta. S., & Varshney, A. (March, 2013). Power distribution sector in India. *Power Plus Distribution.* Retrieved from http://indianpowersector.com/home/wp-content/uploads/2013/03/power-plus-Distribution-new.pdf

Gurumurthy and Redd, Y. J. (2014), Working capital management in power distribution companies in Andhra Pradesh – An Empirical study, *Global Research Analysis, Vol 3*, Issue : 4, April, ISSN No 2277 – 8160.

Hamsalakshmi, R., & Manicham, M. (2005). Financial performance analysis of selected software companies. *Finance India, 19*(3), 915.

Hawawini, G., C. Viallet, and A. Vora, 1986, "Industry Influence on corporation working capital decisions," *Sloan Management Review,* 27, 15-24.

Hossain, S. Z., & Akon, M. H. R. (1997). Financing of working capital: case study of Bangladesh textile mills corporation. *Journal of Financial Management & Analysis*, *10*(2), 37.

Howorth, C., & Westhead, P. (2003). The focus of working capital management in UK small firms. *Management Accounting Research*, *14*(2), 94-111.

Hunjra, A. I., Niazi, G. S. K., Majid, N. R., Akbar, S. W., & Akhtar, M. N. (2011). Practices of working capital policy and performance assessment financial ratios and their relationship with organization performance. *World Applied Sciences Journal*, *12*(11), 1967-1973.

Jahfer, A. (2015). Effects of working capital management on firm profitability: Empirical evidence from Sri Lanka. *International Journal of Managerial and Financial Accounting*, *7*(1), 26-37.

Jajuga, K., & Jajuga, T. (1994). *Jak inwestować w papiery wartościowe*. Naukowe PWN.

Janglani, S., & Sandhar, S. K. (2013). A study on liquidity and profitability of selected Indian cement companies: A Regression modeling approach. *International Journal of Economics, Commerce and Management United Kingdom*, *1*(1), 1-24.

Jingmeng, M. (2013). A Study on working capital management system based on performance. *International Journal of Innovation, Management and Technology*, *4*(1), 100.

Juan García-Teruel, P., & Martinez-Solano, P. (2007). Effects of working capital management on SME profitability. *International Journal of managerial finance*, *3*(2), 164-177.

Joshi, A., Joshi, s., & Gairola, V. (2010). Comparison between working capital management of public and private sector enterprises "Discursions based on comparative case study of TISCO and RINL. *Global journal of Finance and Management*, *2* (2), 173-187.

Kadam, J. J., & Laturkar, V. N. (2011). A study of financial management in small scale industries in India. *International Journal of Exclusive Management Research,* 1(3).

Kapur, K.S. (1999). *Financial Management: Theory and practice.* Published by S.K Publishers, First edition, New Delhi, page No. 284.

Karaduman, H. A., Akbas, H. E., Ozsozgun, A., & Durer, S. (2010). Effects of working capital management on profitability: The case for selected companies in the Istanbul stock exchange. *International Journal of economics and finance studies (online), 2* (2).

Kaur, H. V., Singh, S., & Ropar, P. (2013). Managing efficiency and profitability through working capital: An empirical analysis of BSE 200 companies. *Asian Journal of Business Management*, *5*(2), 197-207.

Keown, J.A. & Martin, J.H. (2005). *Financial Management: Principles and Applications*, 10th Edition. Pearson Edition.

Kequan, Y. (2011, May). An empirical analysis on the performance of working capital management of listed companies in China. In *E-Business and E-Government (ICEE), 2011 International Conference on* (pp. 1-4). IEEE.

Khan, Z., Jawaid, S.T., Arif, I., & Khan, M.N.(2011). Working capital management and firm's profitability in Pakistan: A disaggregated analysis. *African Journal of Business Management,* 6 (9), pp. 3253-3261

Khatik, S. K., & Jain, R. (2009). Working capital analysis of public state undertaking -A case study of Madhya Pradesh State Electricity Board. *Indian Journal of Finance*, *3*(5), 31-38.

Khoury, N. T., Smith, K. V., & MacKay, P. I. (1999). Comparing working capital practices in Canada, the United States, and Australia: a note. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, *16*(1), 53-57.

Kothari, C. R. (2009). *Research methodology: Methods and techniques.* New Delhi: New Age International Publishers. ISBN 978-81-224-15222-3.

KPMG (2010). *Power Sector in India White paper on Implementation Challenges and Opportunities*. Retrieved from https://www.kpmg.de/docs/PowerSector_2010.pdf.

Lazaridis, I., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in the Athens Stock Exchange. *Journal of Financial management and analysis, 19* (1), 26-35.

Mathuva, D. (2009). The influence of working capital management components on corporate profitability: a survey on Kenyan listed firms. *Research Journal of Business Management*, *3*(1), 1-11.

Maxwell, C. E., Gitman, L. J., & Smith, S. A. (1998). Working capital management and financial-service consumption preferences of US and foreign firms: A comparison of 1979 and 1996 preferences. *Financial Practice and Education*, *8*, 46-52.

MCKinsey & Company. (2008). *Powering India The Road to 2017.* Retrieved from http://www.thesuniljain.com/files/thirdparty/McKinsey%20Power.pdf

McInnes, A. N. S. (2000). *Working capital management: theory and evidence from New Zealand listed limited liability companies* (Doctoral dissertation, Lincoln University).

Meenakumari, R., & Kamaraj, N. (2008). Measurement of relative efficiency of state owned electric utilities in India using data envelopment analysis. *Modern Applied Science*, *2*(5), 61.

Mehmet, D. E. N., & Eda, O. R. U. C. (2009). Relationship between efficiency level of working capital management and return on total assets in Istanbul stock exchange. *International journal of Business and Management*, *4*(10), 109.

Meher, Shibalal, and Sahu. (2016). Efficiency of electricity distribution utilities in India: a data envelopment analysis. *OPEC Energy Review*.

Michelski, G. (2007). Portfolio management approach in trade credit decision making. *Romanian journal of economic forecasting, 3/2007*.

Ministry of power (2002). *Distribution Policy Committee Report*. Retrieved from https://www.scribd.com/document/126185832/Distribution-Policy.

Mishra. R.k., Problems of Working Capital Op. Cit, P.94

Mittal, S., Mohinder Kumar, & Bhavet. (2010). Trends in working capital management and its implication on firms performance. *The Indian Journal of Commerce, 63* (3), 39-49.

Mishra, B.K, (1989), *Theory and practice of Inventory management*, Akashdeep Publishing House, Delhi, Page-2.

Mohamad, N. E. A. B., & Saad, N. B. M. (2010). Working capital management: The effect of market valuation and profitability in Malaysia. *International Journal of Business and Management*, *5*(11), 140.

Mukhopadhyay, D. (2004). Working capital management in heavy engineering firms-A case study. *Management Accountant-Calcutta-*, *39*, 317-323.

Nandi, C. K. (2012), Trends in liquidity management and their impact on profitability-A case study, Great Lakes Herald, 6(1), 16-30

Narware, C. (2004). Working capital and profitability -An empirical analysis. *The Management Accountant, 36* (2), 120-127.

Narware, P. C. (2004). Power sector reforms-New perspective. *Management Accountant-Calcutta, 39*(2), 133-136.

Nazir, M. S., & Afza, T. (2009). Impact of aggressive working capital management policy on firms' profitability. IUP Journal of Applied Finance, 15(8), 19.

Niazi, G. S., Hunjra, A. i., Rashid, M., Waqar Akbar, S., & Naeem Akthar, M. (2011). Practices of working capital policy and performance assessment financial ratios and their relationship with organisation performance. *World Applied Sciences Journal, 12* (11), 1967-1973.

Nobanee, H., & Al Hajjar, M. (2009). Working capital management, operating cash flow and corporate performance. *Operating Cash Flow and Corporate Performance (September 10, 2009)*.

Nobanee, H., AlShattarat, W. K., & Haddad, A. E. (2009). Optimizing working capital management. *Abu Dhabi University, Working Paper*.

Noreen, U., Khan, S. K., & Abbas, Q. (2009). International working capital practices in Pakistan. *International Research Journal of Finance and Economics*, *32*(32), 160
170.

Omer, A., Ghosh, S., & Kaushik, R. (2013). Indian power system: Issues and opportunities. *International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering*, *2*(3), 1089-1094.

Ooghe, H. (1998). Financial management practices in China: a case study approach to companies in the Shanghai region. *European Business Review*, *98*(4), 217-226.

Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: an analysis of Mauritian small manufacturing firms. *International Review of business research papers*, *2*(2), 45-58.

Pandey, I. M. (1999). *Financial Management.* Vikas Publishing House Pvt. Ltd.

Pandey, S., & Jaiswal, V. K. (2011). Effectiveness on profitability: Working capital management. *SCMS Journal of Indian Management*, *8*(1), 73.

Panigrahi, A. K. (2014). Relationship of working capital with liquidity, Profitability and solvency: A case study of ACC limited. *Asian Journal of Management Research*, *4*(2), 308-322.

Panigrahi, A. K., & Sharma, A. (2013). Working capital management and firms' performance: An Analysis of selected Indian Cement Companies. *Asian Journal of Research in Business Economics and Management (2013)*.

Panigrahi, A. K. (2014). Understanding the working capital financing strategy -A case study of Lupin Limited). *Journal of Management Research & Analysis*, *1*(1).

Perera, K. W., & Wickremasinghe, G. B. (2010). Working capital management practices of manufacturing sector companies in Sri Lanka: survey evidence. 7(4).

Pargal, S., & Banerjee, S. G. (2014). *More power to India: The challenge of electricity distribution*. The World Bank, Washington

Peel, M. J., & Wilson, N. (1996). Working capital and financial management practices in the small firm sector. *International Small Business Journal*, *14*(2), 52-68.

Planning Commission. (2011). *Mid-term Appraisal: Eleventh Five Year Plan 20072012*. OUP Catalogue

Planning Commission. (2014). *Report of the expert group on estimation of proportion and number of poor* (No. id: 5627).

Thought Arbitrage Research Institute & TERI-Business Council for Sustainable Development (BCSD). *Power Planet to the Sustainability Disclosures by the Indian Power Sector*. Retrieved from http://cbs.teriin.org/pdf/EnCore/power_sector_report.pdf.

Quirin, J. J., O'Bryan, D., Wilcox, W. E., & Berry, K. T. (1999). Forecasting cash flow from operations: Additional evidence. *The Mid-Atlantic Journal of Business*, *35*(2/3), 135.

Rafuse, M. E. (1996). Working capital management: An urgent need to refocus. *Management Decision*, *34*(2), 59-63.

Raheman, A., Afza, T., Qayyum, A., & Bodla, M. A. (2010). Working capital management and corporate performance of manufacturing sector in Pakistan. *International Research Journal of Finance and Economics*, *47*(1), 156-169.

Raheman, A., Qayyum, A., Afza, T., & Bodla, M. A. (2010). Sector-wise analysis of working capital management and firm performance in manufacturing sector of Pakistan. *Interdisciplinary journal of contemporary research in business*, *2*(7), 412.

Ramudu, P. J., & Rao, S. D. (2007). How Efficient is Cash Management? An Investigation into Indian Commercial Vehicles Industry. *South Asian Journal of Management*, *14*(1).

Rao, H. (1987). Financial performance of public enterprises: A study of Karnataka electricity board.

Rathod, S. (2008), Working capital management policies and practices in food and agro industries a case study of Bagalkot district, Karnatak University, Karnataka.

Reddy, S. (2008). *Financial Management Principles and Practices*. Himalaya Publication, Page – 414).

Ricci, C. W., & Morrison, G. (1996). International working capital practices of the Fortune 200. *Financial Practice & Education*, *6*(2), 7-20.

Ricci, C., & Vito, N. (2000). International working capital practices in the UK. *European Financial Management*, *6*(1), 69-84.

Darun, M. R. (2011). *The determinants of working capital management practices: a Malaysian perspective* (Doctoral dissertation, Lincoln University).

Robinson, T. R., Henry, E., Pirie, W. L., & Broihahn, M. A. (2015). *International financial statement analysis*. John Wiley & Sons.

Sahu, R. K. (2000). Analysis of corporate profitability a multivariate approach. *MANAGEMENT ACCOUNTANT-CALCUTTA-*, *35*(8), 571-578.

Saleem, Q., & Rehman, R. U. (2011). Impacts of liquidity ratios on profitability. *Interdisciplinary Journal of Research in Business*, *1*(7), 95-98.

Sandhar, S. K., & Janglani, S. (2013). A study on liquidity and profitability of selected indian cement companies: a regression modeling approach. *International Journal of Economics, Commerce and Management. 1*(1)

Sathyamoorthi, C. R. (2002). Management of working capital in selected co-operatives in Botswana. *Finance India*, *16*(3), 1015.

Saxena, S., & Thakur, T. (2010). EMPIRICAL analysis for management of indian electricity distribution utilities. *Journal of Environmental Research and Development, 5*(1).

Schramm, G. (1993). Improving power utility performance in developing countries. *Utilities Policy*, *3*(1), 51-61.

Seeger, S., Locker, A., & Jergen, C. (2011). Working capital management in Swiss chemical industry. *Journal of Business Chemistry*, *8*(2), 87-98

Seiden, M. H. (1964). Measuring Trade Credit Quality: Changes in Credit Standards. Chapter-I. NBER, 37-49

Selvi, D. (2005), "Financial Performance of Pharma Company: A case study, *Southern Economist*, 45.

Shah, S. Shah, S. A., & Sana, A. (2006). Impact of working capital management on the profitability of oil & gas sector of Pakistan. *European Journal of Scientific Research, 15* (3), 301-307.

Sharma, A. K., & Kumar, S. (2011). Effect of working capital management on firm profitability empirical evidence from India. *Global Business Review*, *12*(1), 159-173.

Sharma, N.K. (2002). Financial Appraisal of Cement Industry in India, *The Management Accountant, 36* (9) pp 622- 625.

Shin, H. H., & Soenen, L. (1998). Efficiency of working capital management and corporate profitability. *Financial practice and education*, *8*, 37-45.

Mahajan, S., & Sarkar, M. (2007). How does financial performance of MNCs in the automobile sector compare with Indian companies? An analysis using financial ratios. *Paradigm*, *11*(2), 38-45.

Shukla, A., (2002). *Working capital management.* RBSA Publishers. Jaipur.

Shulman, J. M., & Cox, R. A. (1985). An integrative approach to working capital management. *Journal of Cash Management*, *5*(6), 64-68.

Singh, A. (2007). *Policy Environment and Regulatory Reforms for Private and Foreign Investment in Developing Countries: A Case of the Indian Power Sector*. Asian Development Bank.

Singh, A. (2006). Power sector reform in India: current issues and prospects. *Energy policy*, *34*(16), 2480-2490.

Singh, K., & Asress, F. C. (2011). Determining working capital solvency level and its effect on profitability in selected Indian manufacturing firms. *International Journal of Research in Commerce, Economics & Management*.

Singh, K., & Asress, F. C. (2011). Determining working capital solvency level and its effect on profitability in selected Indian manufacturing firms. *International Journal of Research in Commerce, Economics & Management*.

Singh, V., & Srivastava, A. (2015). Receivables Management in Leading Heavy Electrical Industries in India. *Journal Impact Factor*, *6*(4), 01-08.

Smith, A. (1976). An inquiry into the nature and causes of the wealth of nations (ed. RH Campbell, AS Skinner, and WB Todd).

Smith, M. B., & Fletcher, L. (2009). Factors influencing working capital management in South Africa. *Management Dynamics*, *18*(3), 15

Smith, K. V., & Sell, S. B. (1980). Working capital management in practice. *Readings on the management of working capital*, 51-84.

Sreekumar, N., Reddy, M. T., & Raghu, K. (2007). Strengths and challenges of Andhra Pradesh power sector. *Economic and Political Weekly*, 24-27..

Srivastava. R.M; 2003, *Financial Management and Policy*, Himalaya Publishing House Page – 480.

Srinivas (2011). *Working capital management of power sector companies In India* (Unpublished doctoral dissertation). Magadh University. Bihar. India.

Strischek, D. (2001). A banker's perspective on working capital and cash flow management. *Strategic Finance*, *83*(4), 38-38

Sudhakar, A., & Sreelatha, K. (2010). Cost structure of power distribution companies in Andhra Pradesh. *Indian Journal of Accounting, XLI (1)*, 25-34. 15.

Tafri, F. , Hamid, Z. , Meera, A. , Omar, M. (2009). 'The Impact of financial risks on profitability of Malaysian commercial banks: 1996-2005'. *World Academy of Science, Engineering and Technology,* 3(6), 1320 - 1334.

Talbott, W. (2013). *Lighting the Way: Unlocking Performance Gains in Electricity Distribution and Retailing in India* (Doctoral dissertation, Harvard University).

Talekar, S. D. (2005). *Management of working capital*. Discovery Publishing House.

Tauringana, V., & Adjapong Afrifa, G. (2013). The relative importance of working capital management and its components to SMEs' profitability. *Journal of Small Business and Enterprise Development*, *20*(3), 453-469.

The Economy of Andhra Pradesh. (2009). Power distribution reforms in Andhra Pradesh. Chapter –IV. Retrieved from http://www.aponline.gov.in/apportal/humandevelopmentreport2007/aphdr_2007_cha pter4.pdf

The Economy of Andhra Pradesh. (2009). Power distribution reforms in Andhra Pradesh. Chapter –IV. *Retrieved from http://www.idfc.com/pdf/publications/AP-DistributionReforms-Draft-Report.pdf*

Thuvarakan, S. (2013). Impact of working capital management on profitability in UK Manufacturing Industry. *Available at SSRN 2345804*.

Tufail, S., Sidra, B., and Amjad. (2013). Impact of working capital management on profitability of Textile sector of Pakistan. *Elixir Financial Management*. 57A (2013) 14387-14397

Vasudha Foundation., (2013). *Current Status of Rural Electrification and Electricity Service Delivery in Rural Areas of India,* Retrieved from http://www.vasudhafoundation.org/wpcontent/uploads/2)%20Reader%20Friendly%2 0Paper%20for%20USO_Status%20of%20Rural%20electrification%20status%20in% 20India.pdf.

VijayKumar, A., & Venkatachalam, A. (1996). Responsiveness of working capital Management–A case study of Tamil Nadu Sugar Corporation. *Finance India*, *10*(3), 647-655.

Vishnani, S., & Shah, B. K. (2007). Impact of working capital management policies on corporate performance—An empirical study. *Global Business Review*, *8*(2), 267-281.

WILKES, T. 2014. Indian power sector faces $27 bln in annual losses - World Bank.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.

World Bank (JUNE 2001), Case Study Public Debt Management, Cash Management, and Domestic Debt Market Development, *Macroeconomic and Financial Management Institute of Eastern and Southern Africa*, retrieved from http://treasury.worldbank.org/bdm/pdf/1A-PDM_casestudy_tanzania.pdf.

World Bank. (2005). The Challenge of Financing Infrastructure in Developing Countries. Chapter VI.page147-165 Retreived from http://siteresources.worldbank.org/GDFINT2004/Home/20177051/gdf_chapter%206. pdf

Yadav, Rakesh, Vani Kamath, and Pradip Manjrekar. (2009). Working capital management: A study of Maharashtra's bulk drugs listed companies. *Chemical Business* 23(7), 27 34.

Zariyawati, M. A., Taufiq, H., Annuar, M. N., & Sazali, A. (2010, June). Determinants of working capital management: Evidence from Malaysia. In *Financial Theory and Engineering (ICFTE), 2010 International Conference on* (pp. 190-194). IEEE.